STUDY OF RESPIRATORY DISEASE PATTERN IN CHILDREN IN AGE GROUP OF 2 MONTHS – 5 YEARS ADMITTED IN TERTIARY CARE HOSPITAL TIRUNELVELI GOVERNMENT MEDICAL COLLEGE

Dissertation submitted in partial fulfilment of the

Requirement for the award of the Degree of

M.D. DEGREE – BRANCH VII

PAEDIATRICS

MAY 2018

TIRUNELVELI MEDICAL COLLEGE HOSPITAL

THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY,

CHENNAI,

TAMIL NADU

CERTIFICATE

This is to certify that the Dissertation entitled "**STUDY OF RESPIRATORY DISEASE PATTERN IN CHILDREN IN AGE GROUP OF 2 MONTHS – 5 YEARS ADMITTED IN TERTIARY CARE HOSPITAL TIRUNELVELI GOVERNMENT MEDICAL COLLEGE"** submitted by **Dr.J.SHABIN, MBBS.,** to The Tamilnadu Dr.M.G.R. Medical University, Chennai, in partial fulfilment for the award of M.D (Paediatrics) is a bonafide work carried out by his under my guidance and supervision during the academic year 2015-2018. This dissertation partially or fully has not been submitted for any other degree or diploma of this university or other.

GUIDE
Prof.Dr.T.R.R.Ananthy Shri, M.D., (Paediatrics).,
Department Paediatrics,
Tirunelveli Medical College,
Tirunelveli- 627011.

HOD
Prof.Dr.C.Krishnamurthy,MD., (Paediatrics).,
Department Paediatrics,
Tirunelveli Medical College,
Tirunelveli- 627011.

Dr.K.Sithy Athiya Munarvah,
THE DEAN,
Tirunelveli Medical College,
Tirunelveli- 627011.

DECLARATION

I, Dr.J.SHABIN, MBBS., solemnly declare that the Dissertation titled **"STUDY OF RESPIRATORY DISEASE PATTERN IN CHILDREN IN AGE GROUP OF 2 MONTHS – 5 YEARS ADMITTED IN TERTIARY CARE HOSPITAL TIRUNELVELI GOVERNMENT MEDICAL COLLEGE"** has been prepared by me under the expert guidance and supervision of **Prof.Dr.T.R.R. Ananthy Shri, M.D.,(Paediatrics).,**Professor, Department of Paediatrics, Tirunelveli Medical College Hospital, Tirunelveli.

The dissertation is submitted to The Tamilnadu Dr. M.G.R. Medical University, Chennai in partial fulfilment of the regulation for the award of M.D. Degree (Branch VII) in Paediatrics.

It was not submitted to the award of any degree/diploma to any University either in part or in full previously.

Place: Tirunelveli.
Date:

Dr.J.SHABIN, MBBS.,
POST GRADUATE,
M.D. (Paediatrics),
Tirunelveli Medical College,
Tirunelveli.

ACKNOWLEDGEMENT

I am very much thankful to the Dean **Dr.K.Sithy Athiya Munarvah**, Triunelveli Medical College Hospital, Tirunelveli, who has granted permission to do this study in this institution,

I take this opportunity to express my deepest sense of gratitude to professor **Prof.Dr.C.Krishnamurthy,MD.,(Paediatrics).,** Professor and Head of the Department of Paediatrics, Tirunelveli Medical College Hospital, Tirunelveli for encouraging me and rendering timely suggestions for completing my thesis.

I take this opportunity to express my deepest sense of gratitude to **Prof.Dr.T.R.R. Ananthy Shri, M.D., (Paediatrics).,** for guiding me throughout the course of this study. I will be forever indebted to her for her constant support.

I sincerely thank my professors **Prof.Dr. A.S.Babu Kandakumar, MD.,DCH., Prof. Dr.J. Rukmani, M.D.,(Paediatrics)., Prof. Dr.C. Baskar, M.D.,(Paediatrics).,** for their support and guidance.

I am extremely thankful to all my **Assistant Professors** of the **Department of Paediatrics** for their guidance and support throughout my study period in this institution.

I wish to express my gratitude to my parents, and my wife for their support throughout my study.

I also like to express my gratitude to my friends and colleagues who have always been a source of love, support and encouragement.

TIRUNELVELI MEDICAL COLLEGE

INSTITUTIONAL RESEARCH ETHICS COMMITTEE
TIRUNELVELI, STATE OF TAMILNADU, SOUTH INDIA PIN 627011
91-462-2572733-EXT; 91-462-2572944; 91-462-2579785; 91-462-2572611-16
online@tvmc.ac.in, tirec@tvmc.ac.in; www.tvmc.ac.in

CERTIFICATE OF REGISTRATION & APPROVAL OF THE TIREC REF NO: 797/PAED/ 2015

PROTOCOL TITLE: STUDY OF RESPIRATORY DISEASE PATTERN IN CHILDREN IN AGE GROUP OF 2 MONTHS -5 YEARS ADMITTED IN TERTIARY CARE HOSPITAL TIRUNELVELI MEDICAL COLLEGE HOSPITAL DURING 01.11.16 TO 01.06.17

PRINCIPAL INVESTIGATOR: DR.J.SHABIN, MBBS.,

DESIGNATION OF PRINCIPAL INVESTIGATOR POST GRADUATE IN PAEDIATRICS
DEPARTMENT & INSTITUTION: TIRUNELVELI MEDICAL COLLEGE , TIRUNELVELI

Dear , Dr.J.Shabin, MBBS., The Tirunelveli Medical College Institutional Ethics Committee (TIREC) reviewed and discussed your application during the IEC meeting held on 10.12.15.

THE FOLLOWING DOCUMENTS WERE REVIEWED AND APPROVED

1. TIREC Application Form ☐
2. Study Protocol ☐
3. Department Research Committee Approval ☐
4. Patient Information Document and Consent Form in English and Vernacular Language ☐
5. Investigator's Brochure ☐
6. Proposed Methods for Patient Accrual Proposed ☐
7. Curriculum Vitae of the Principal Investigator ☐
8. Insurance /Compensation Policy ☐
9. Investigator's Agreement with Sponsor ☐
10. Investigator's Undertaking ☐
11. DCGI/DGFT approval ☐
12. Clinical Trial Agreement (CTA) ☐
13. Memorandum of Understanding (MOU)/Material Transfer Agreement (MTA) ☐
14. Clinical Trials Registry-India (CTRI) Registration ☐

THE PROTOCOL IS APPROVED IN ITS PRESENTED FORM ON THE FOLLOWING CONDITIONS

1. The approval is valid for a period of 2 year/s or duration of project whichever is later
2. The date of commencement of study should be informed
3. A written request should be submitted 3weeks before for renewal / extension of the validity
4. An annual status report should be submitted.
5. The TIREC will monitor the study
6. At the time of PI's retirement/leaving the institute, the study responsibility should be transferred to a person cleared by HOD
7. The PI should report to TIREC within 7 days of the occurrence of the SAE. If the SAE is Death, the Bioethics Cell should receive the SAE reporting form within 24 hours of the occurrence.
8. In the events of any protocol amendments, TIREC must be informed and the amendments should be highlighted in clear terms as follows:
    a. The exact alteration/amendment should be specified and indicated where the amendment occurred in the original project. (Page no. Clause no. etc.)
    b. The PI must comment how proposed amendment will affect the ongoing trial. Alteration in the budgetary status, staff requirement should be clearly indicated and the revised budget form should be submitted.
    c. If the amendments require a change in the consent form, the copy of revised Consent Form should be submitted to Ethics Committee for approval. If the amendment demands a re-look at the toxicity or side effects to patients, the same should be documented.
    d. If there are any amendments in the trial design, these must be incorporated in the protocol, and other study documents. These revised documents should be submitted for approval of the IEC, only then can they be implemented.
    e. Approval for amendment changes must be obtained prior to implementation of changes.
    f. The amendment is unlikely to be approved by the IEC unless all the above information is provided.
    g. Any deviation/violation/waiver in the protocol must be informed.

STANDS APPROVED UNDER SEAL

Dr.K.Shantaraman MD
Registrar, TIREC
Tirunelveli Medical College, Tirunelveli – 627011
State of Tamilnadu, South India

TIRUNELVELI MEDICAL COLLEGE TAMILNADU INDIA TIRUNELVELI

Dr.V.Ramasubramanian MD DM
Member Secretary, TIREC
Tirunelveli Medical College, Tirunelveli – 627011
State of Tamilnadu, South India

CERTIFICATE - II

This is certify that this dissertation work title **STUDY OF RESPIRATORY DISEASE PATTERN IN CHILDREN IN AGE GROUP OF 2 MONTHS – 5 YEARS ADMITTED IN TERTIARY CARE HOSPITAL TIRUNELVELI GOVERNMENT MEDICAL COLLEGE** of the candidate **Dr.J.SHABIN,MBBS.,** with registration Number **201517352** for the award of **M.D.(PAEDIATRICS)** in the branch of **VII**. I personally verified the urkund.com website for the purpose of plagiarism check. I found that the uploaded thesis file contains from introduction to conclusion page and result shows **4 percentage** of plagiarism in the dissertation.

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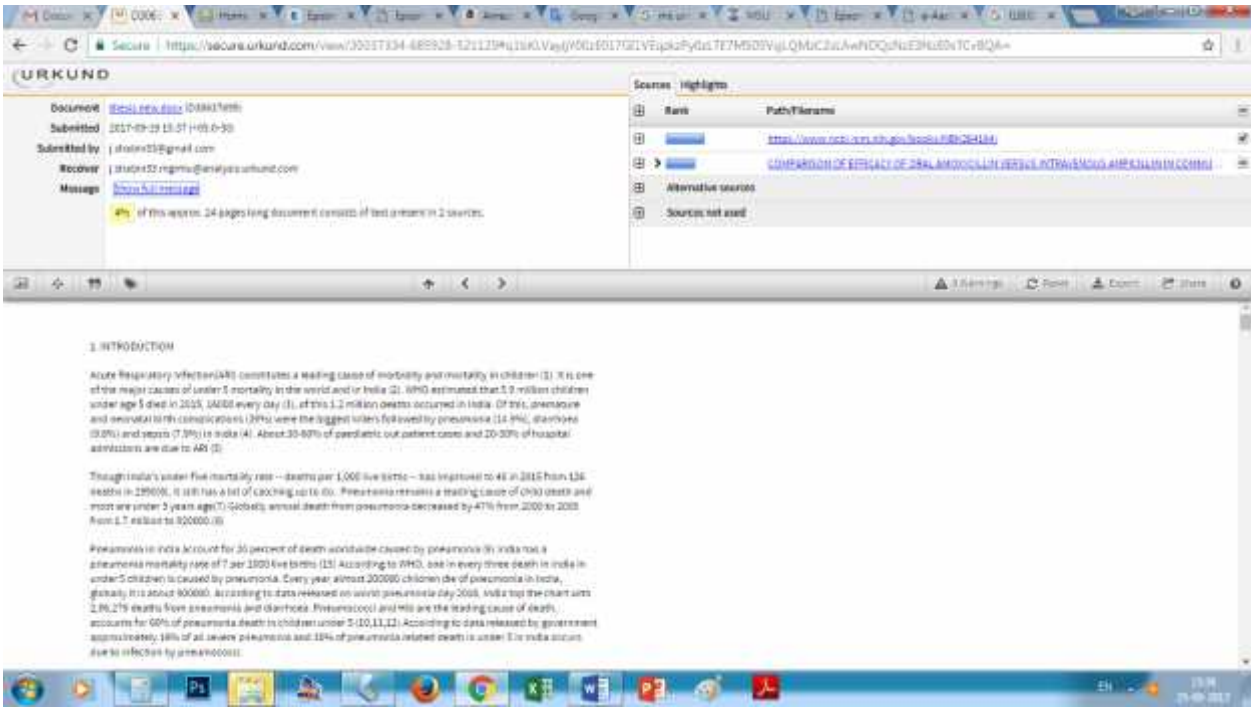
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1 INTRODUCTION

CONTENTS

1. INTRODUCTION

Acute Respiratory Infection(ARI) constitutes a leading cause of morbidity and mortality in children (1). It is one of the major causes of under 5 mortality in the world and in India (2). WHO estimated that 5.9 million children under age of 5 years died in 2015, almost 16000 children die every day (3). Out of this 1.2 million deaths occurred in India. Of this, premature and neonatal birth complications (39%) were the biggest killers followed by pneumonia (14.9%), diarrhoea (9.8%) and sepsis (7.9%) in India (4). About 30-60% of paediatric out patient cases and 20-30% of hospital admissions are due to ARI (5).

Though India's under-five mortality rate -- deaths per 1,000 live births -- has improved to 48 in 2015 from 126 deaths in 1990(6), it still has a lot of catching up to do. Pneumonia remains a leading cause of under 5 mortality(7).Globally annual death from pneumonia decreased by 47% from 2000 to 2005 from 1.7 million to 920000(8).According to a research done as a part of million death study, India has avoided about 1 million deaths of children under age five since 2005, due to reduction in mortality from pneumonia, diarrhea, tetanus and measles.

India accounted for 20 percent of death worldwide caused by pneumonia (9). India has a pneumonia mortality rate of 7 per 1000 live births (15) According to WHO, one in every three death in India in under 5

children is caused by pneumonia. Every year almost 200000 children die of pneumonia in India, globally it is about 900000. According to data released on world pneumonia day 2016, India top the chart with 2,96,279 deaths from pneumonia and diarrhoea. Pneumococcal pneumonia and Hib pneumonia are the leading cause of death, accounts for 60% of pneumonia death in children under 5 (10,11,12).According to data released by government approximately 16% of all severe pneumonia and 30% of pneumonia related death in under 5 in India occurs due to infection by pneumococci.

Government is introducing various measures to further reduce under 5 mortality in India, especially death due to vaccine preventable diseases. One such measure is the introduction of pneumococcal vaccine in immunization schedule as a pilot programme in some states (13,14). PCV protects against severe forms of pneumococcal disease, like pneumonia and meningitis. Currently, the vaccine is being introduced to approximately 21 lakh children in Himachal Pradesh and also in some parts of Bihar and Uttar Pradesh in the first phase. This will be followed by introduction of the vaccine in Madhya Pradesh and Rajasthan in the coming year, and eventually be expanded to the country in a phased manner. Hib vaccine has already been introduced in national immunization schedule as pentavalent vaccine. Government is also taking various measures like MISSION INDRADHANUSH to cover more children under vaccination. Mission

Indradhanush, launched in 2014, is a national immunization drive that aims to strengthen India's immunization system and increase full immunization coverage to at least 90% by 2018(16). Mission Indradhanush has led to vaccination of around 21 million children of which more than 5.5 million children have been fully immunized (17) 5.5 million pregnant women were immunized with TT vaccination. From 1% annual increase in coverage of full immunization, 6.7% annual expansion in the immunization cover has occurred following Mission Indradhanush (16)

India ranks third lowest compared to the 15 other high burden countries for its Global Action Plan for Pneumonia and Diarrhoea (GAPPD) score – a calculated average of coverage levels for the vital pneumonia and diarrhoea interventions outlined in the World Health Organization (WHO) and UNICEF's integrated GAPPD for which data are available, including vaccination, exclusive breastfeeding, access to care, and use of antibiotics, oral rehydration solution (ORS), and zinc. However, India is improving its position in ranking following the recent measures it has made toward improving access to child health interventions like including Hib and pneumococcal vaccine and promoting exclusive breast feeding (18). The integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea (GAPPD) aims at a cohesive approach to ending preventable diseases like pneumonia and diarrhoea deaths. It helps in bringing critical services and interventions to create

healthy environments, promotes practices known to protect children from disease and ensures that every child has access to proven and appropriate preventive and treatment measures. The goal is to end preventable childhood deaths due to pneumonia and diarrhoea by 2025(19).

Two-thirds of child deaths are preventable. Most of the children who die each year could be saved by low-tech, evidence-based, cost-effective measures such as vaccines, antibiotics, micronutrient supplementation, insecticide-treated bed nets, improved family care , improving hygiene and exclusive breast feeding practices, and oral rehydration therapy. Empowering women, removing financial and social barriers to accessing basic services, developing innovations that make the supply of critical services more available to the poor and increasing local accountability of health systems are policy interventions that have allowed health systems to improve equity and reduce mortality.

In developing countries, child mortality rates related to respiratory and diarrheal disease can be reduced by introducing simple behavioural changes such as exclusive breast feeding, utilisation of immunisation services and proper hand washing measures.

Millions of lives can be saved by simple cost effective methods. Despite success in immunizations in reducing polio, tetanus, and measles, immunization interventions still do not reach 30 million children,. Measles

and tetanus still kill more than 1 million children under 5 each year. Essential new-born care like immunizing mothers against tetanus, ensuring clean delivery practices, drying and wrapping the baby immediately after birth, providing adequate warmth, and promoting immediate and continued breastfeeding, immunization as per schedule, and treatment of infections with antibiotics - could save the lives of about 3 million new-borns annually. Improved sanitation and access to clean drinking can reduce childhood infections and diarrhoea.

2. REVIEW OF LITERATURE

1. Padmanabhan Ramachandran et al conducted a study about case fatality and factors determining the death for community acquired pneumonia. Study was conducted in ICH Chennai, during time period 2006-2008. In that study 48% of admissions were in the age group less than 6 months. The cause mortality rate was 8.2%. The mortality rate was lower in children of higher age groups. The risk factors Contributing to mortality were identified as age 1-6 months, weight for age less than -2 Zscore, shock, CHD, need for assisted ventilation. The difference in mortality among females and males were not statistically significant.
2. Bipin Prajapathi et al conducted a study of epidemiological profile of ARI in under 5 children in urban and rural communities of Ahmedabad. Of the total study47.3% of ARI cases belongs to age group 4-5. 56.3% were boys and 43.7% were girls. ARI was common in low socioeconomic status which was statistically significant.48.3%belongs to socioeconomic class 4/5. There was statistically significant higher incidence of ARI in overcrowded homes. Also there was statistically significant relation between nutritional status and ARI incidence. Occurrence of ARI was higher in children of mothers who continued breast feeding up to 3 months (40.0%) as compared to breast feeding up to the age of 6 months, 9 months and 12 months i.e29.7%, 27.2% and 30.4% respectively. This difference was not statistically significant (p >

0.05).In this study 43.8% were fully immunized, 33.8% were not immunized and 22.4% were partially immunized .There is statistically significant relation between ARI and complete immunisation.33.7% were unimmunised.

3. Savitha et al conducted a study on modifiable risk factors of ARI in under 5 children. A prospective case control study was conducted from March 2005 to august 2005 at cheluvamba hospital Mysore. In this study 65% were infants,31% were 1 to 3 years age. There is slight male predominance. Inappropriate immunization significantly affects incidence of ARI (21.15% vs 7.69%) with pvalue <0.001.Overcrowding was significantly affected with ARI (91.35% vs 20.19%) with p value <0.001. Also more ALRI cases are from socio economic status4/5 (93.26% vs. 62.5%) with p value <0.001.In this study early weaning before 4 months had significant association with ALRI(37.5% VS 13.46%) with p value <0.01.Malnutrition was present in 83.86 % with p value < 0.01.

4. Farzana islam et al conducted a study on profiling of ARI cases in Assam. It was a community based cross sectional study. The prevalence of ARI was common in 1-12 months group (38.14%) followed by 13- 24 months (21.65%). Females were more affected with ARI (27.35%) than males (25.69%). As the children grew older, the prevalence of ARI gradually decreased in this study. Undernourished

children has an increased risk of ARI as compared to normal children (RR = 3.76). Non-immunized children has more chances of developing ARI, (RR = 2.01). Complete immunization among ARI cases was only 10% in this study. In the non-immunized group ARI cases was noted as 57.5 %. In this study there is association of overcrowding (81.44%) with risk of ARI.

5. Vinod K Ramani et al conducted a longitudinal cohort study for one year on ARI among under 5 at urban slums of Gulbarga city. In that study, the incidence was 27.25%.Also, the age specific incidence of ARI decreased with increasing age, significantly higher for infants (OR=1.94).study showed a significantly higher susceptibility of boys than girls,(OR=.41).ARI incidence was found to be associated with maternal literacy status in this study. Also, significantly higher risk was found in children from SES 4/59(OR=3.26, 5.5 for 4 and 5 resp). Study also showed significant association with overcrowding, paternal education, family history of respiratory tract illness, housing status and cooking fuel used.

6. Ganavi Ramagopal et al (20) conducted a study on demographic, clinical and hematological profile of children with bronchiolitis. It was a prospective study conducted in Chettinad hospital and research institute. Study showed 50% of cases are RSV positive and 50% cases are non RSV. Major age group affected was infants with mean age 7.3 ±

2 , with males affected more. In this study cough and respiratory distress were the prominent symptom.

7. Iqbal et (21) conducted a study on epidemiological and clinical profile of acute bronchiolitis. 107 children were included in this study. Mean age was of presentation is 11.3 ± 5 months. Male to female ratio is 1.3. Mean weight of the children were 9.3 ± 2.2 kg. 48% percent children are bottle fed and 38% are breast fed. Thirty eight percent children presented with bronchiolitis had family history of acute respiratory tract illness while 14% children had family history of allergy. 91% of children had respiratory distress at the time of presentation, 76% had nasal flaring, 72% wheezing, 64% had fever, 41% retractions and 32% had decreased feeding at the time of presentation

ACUTE RESPIRATORY INFECTIONS

Acute respiratory infections (ARIs) are classified in to upper respiratory tract infections (URIs) and lower respiratory tract infections (LRIs). The upper respiratory tract starts from the nostrils to the vocal cords in the larynx, including the paranasal sinuses and the middle ear. The lower respiratory tract starts from the trachea and bronchi to the bronchioles and the alveoli. ARIs are not confined to the respiratory tract and have systemic effects because of extension of infection or microbial toxins, inflammation, and reduced lung function. ARIs are the most

common causes of both illness and mortality in children under five, who average three to six episodes of ARIs annually regardless of where they live or what their economic situation is (22)(23). The proportion of mild to severe disease varies between high- and low-income countries. Due to differences in specific etiologies and risk factors, the severity of LRIs in children under five is worse in developing countries, resulting in a higher case-fatality rate. Although with treatment we can reduce to some extend both severity and fatality, many severe LRIs do not respond to therapy, because of the lack of highly effective antiviral drugs. Nearly 10.8 million children die each year due to ARI (24). Estimates indicate that in 2000, 1.9 million of them died because of ARIs, 70 percent of them in Africa and Southeast Asia (25). The World Health Organization (WHO) estimates that 2 million children under five die of pneumonia each year (26).

UPPER RESPIRATORY TRACT INFECTIONS

URIs are the most common among the respiratory tract infections. Upper respiratory tract infections consist of rhinitis (common cold), sinusitis, ear infections, acute pharyngitis or tonsillopharyngitis, epiglottitis, and laryngitis. The ear infections and pharyngitis cause the more severe complications such as deafness and acute rheumatic fever, respectively. The majority URI are caused by viruses. Rhinoviruses account for 25 to 30 percent of URI. Respiratory syncytial viruses (RSVs),

parainfluenza and influenza viruses, human metapneumovirus, and adenoviruses account for 25 to 35 percent; corona viruses for 10 percent; and unidentified viruses for the remainder (27). As most URIs are self-limiting, their complications are more important than the infections. Acute viral infections predispose children to bacterial infections of the sinuses and middle ear (28), and aspiration of infected secretions can result in LRIs.

Acute Pharyngitis

Acute pharyngitis is caused by viruses in more than 70 percent of cases in young children. Streptococcal infection is rare in children under five and more common in older children. In countries with crowded living conditions and populations that may have a genetic predisposition, poststreptococcal sequelae such as acute rheumatic fever and carditis are common in school-age children but may also occur in those under five. Acute pharyngitis in conjunction with the development of a membrane on the throat is caused by Corynebacterium diphtheriae in developing countries. However, with the almost universal vaccination of infants with the DTP vaccine, diphtheria is rare now.

Acute Ear Infection

30 percent of URIs are associated with Acute ear infections. If there is inadequate medical care, it can lead to perforated eardrums and chronic

ear discharge in later childhood and finally to hearing impairment or deafness. Repeated episodes of acute ear infection leads to chronic ear infection and it is common in developing countries, seen in 2 to 6 percent of school-age children. The resulting hearing loss can be disabling and may affect learning. Repeated ear infections can results in mastoiditis, which can spread infection to the meninges. Worldwide mastoiditis and other complications of URIs account for nearly 5 percent of all ARI deaths. (25)

LOWER RESPIRATORY TRACT INFECTIONS

Pneumonia and bronchiolitis are the common LRIs in children. The increased respiratory rate diagnose acute LRI in children who are coughing and breathing rapidly. The presence of lower chest wall retraction identifies more severe disease.

The most common causes of viral LRIs are RSVs. The occurrence is highly seasonal. Parainfluenza viruses are next most common cause of viral LRIs. The influenza viruses infections can be effectively prevented by widespread use of vaccines. The measles virus was once the most important cause of respiratory tract–related morbidity and mortality in children in developing countries, but after the introduction of vaccines its incidence decreases.

PNEUMONIA

Pneumonia is defined as inflammation of lung parenchyma (29). It is the leading cause of under 5 mortality globally.

AETIOLOGY

Most cases of pneumonia are caused by microorganisms. 40 to 80% of children with community acquired pneumonia has an identified bacterial or viral cause. Streptococuss pneumonia is the most common bacterial pathogen in the age group 3 week to 4 years. In older children more than 5 years, mycoplasma pneumonia and chlamydia pneumonia are the most frequent bacterial pathogens. Other causes of bacterial pneumonia are streptococcus pyogenes and staphylococcus aureus. Streptococcus pneumonia, haemophilus influenzae, staphylococcus aureus are the major cause of death and hospitalisation in developing countries. In children with HIV, microorganisms like mycobacterium tuberculosis, salmonella, atypical mycobacteria, Escherichia coli, or pneumocystis jiroveci can cause pneumonia.

The cause of pneumonia is often difficult to determine, because direct culture of lung tissue is an invasive procedure and is not usually performed. culture obtained from upper respiratory tract or sputum need not correctly reflect the causative agent of lower respiratory tract infection.

Non-infectious causes of pneumonia includes aspiration of food, gastric juice, foreign bodies or hydrocarbons. Other causes are hypersensitivity reaction, drug or radiation induced pneumonitis.

Viral pathogens are an important cause of lower respiratory tract infection in infants and in children more than 1 months and younger than 5 years age. Viruses are identified in about 40 to 80 % of children with pneumonia. Respiratory syncytial virus and rhinovirus are the most common pathogens , mainly in children less than 2 years age. Other viruses are, adenovirus, parainfluenza virus, influenza virus, enterovirus, and human metapneumovirus. Up to 20% cases have more than one virus as aetiology.

PATHOGENESIS

The defensive mechanism that keeps the lower respiratory tract sterile include mucociliary clearance, secretory immunoglobulin Ig A and cough reflex. Aspiration, trauma in the airway, and anesthesia increases the risk of pneumonia.

Viral pneumonia is caused by spread of infection along the airway. It causes injury to airway respiratory epithelium causing swelling which results in airway obstruction. Young infants have small calibre airways, making them more vulnerable to severe infection. Airway obstruction is

accompanied by atelectasis, interstitial edema, and ventilation perfusion mismatch. Viral infection causes disturbance in the normal defence mechanism, altering secretions, and modify bacterial flora which make such children vulnerable to secondary bacterial infection.

Bacterial pneumonia can occur either by initial colonisation on trachea followed by gaining access in to lung parenchyma or by direct seeding of lung tissue following bacteremia. Mycoplasma pneumonia get attached to epithelium and inhibit ciliary motility. This leads to cellular damage and causes an inflammatory response in the submucosa.

Streptococcuss pneumonia causes local edema. It helps in proliferation and further spread in to other portions of lung, resulting in focal lobar involvement.

Group A streptococcus infection causes diffuse infection with interstitial pneumonia. It causes necrosis of tracheobronchial mucosa, exudate, edema and haemorrhage in the local area. There can be extension in to interalveolar septa, involvement of lymphatic vessels, and more chance of pleural involvement.

Staphylococcus pneumonia can cause confluent bronchopneumonia. It is characterised by hemorrhagic necrosis and lung parenchymal

cavitation. It can get complicated with pneumatocele, empyema or bronchopulmonary fistula (29).

CLINICAL FEATURES

Pneumonia is usually preceded by symptoms like rhinitis and cough. Fever is usually present both in viral and bacterial pneumonia, with temperature generally lower for viral pneumonia. Tachypnea is the most important and consistent clinical feature of pneumonia. Increased work of breathing is characterised by subcostal, intercostal and suprasternal retractions, nasal flaring and use of accessory muscles of respiration. Severe infection is characterised by cyanosis and letharge, mainly in infants. On chest auscultation, crackles and wheezing can be heard. In infants and young children it is very difficult to localise the adventitious sounds.

Bacterial pneumonia in older children and adults is characterised by sudden onset of high grade fever, chest pain and cough. Other clinical features include drowsiness, tachypnea, anxiety and often delirium.

Physical findings depends on various stages of pneumonia. In the initial course of illness, reduced breath sounds, crackles, and rhonchi are more heard on affected lung field. With increasing consolidation, complications like pleural effusion and empyema, breath sounds may be

diminished and dullness on percussion. Gastric dilatation or ileus can cause abdominal distension. Abdominal pain is more prominent in lower lobe pneumonia. There will be downward displacement of diaphragm causing pushed down liver due to hyperinflation of lungs.

In infants, clinical pattern is considerably more variable. It is characterised by reduced appetite, abrupt onset of fever, restlessness, apprehension and increased respiratory effort. Infant appears ill, can have grunting, nasal flaring, supraclavicular retractions, intercostal retraction, subcostal retractions. There can also be tachycardia, tachypnea, air hunger and cyanosis. Some can have associated gastrointestinal disturbances like vomiting, anorexia, diarrhea, abdominal distension due to ileus. In most severe cases of bacterial pneumonia there can be rapid progression of symptoms.

INVESTIGATIONS

Chest X ray can confirm the diagnosis of pneumonia. Complications like pleural effusion or empyema can be identified. Viral pneumonia is characterized by hyperinflation with bilateral interstitial infiltrates and peribronchial cuffing. Pneumococcal pneumonia is characterised by confluent lobar consolidation.

In viral pneumonia WBC count is usually less than 20000/mm cube, predominantly lymphocytes. Bacterial pneumonia is characterised by elevated WBC count in the range of 15000-40000/mm cube and predominance of granulocytes.

Pleural effusion, lobar consolidation, and high grade fever are suggestive of bacterial etiology. Atypical pneumonia caused by Chlamydia pneumonia or Mycoplasma pneumonia is often difficult to distinguish between pneumococcal pneumonia based on X-ray or laboratory findings alone. Ultrasound thorax can also contribute to the diagnosis.

Diagnosis of viral pneumonia depends on the isolation of a virus or detection of viral genome or antigen in the respiratory tract secretion. serologic testing may be useful for identifying the prevalence and incidence of various virus pathogens. The definitive diagnosis of bacterial pneumonia isolation of organism from the blood, pleural fluid or lungs. Sputum culture has little value in the diagnosis of pneumonia in children. Blood culture is positive only in about 10% cases.

REVISED WHO CLASSIFICATION OF PNEUMONIA AND TREATMENT

The new classification is simplified to include only two categories of pneumonia; “pneumonia” with fast breathing and/or chest indrawing.

which requires home therapy with oral amoxicillin, and “severe pneumonia”, pneumonia with any general danger sign, which requires referral and injectable therapy. Dosages for pneumonia treatment at health facilities have been revised to reflect three age bands: 2 months up to 12 months (4–<10 Kg), 2 years up to 5 years (14 to 19 kg) . Dosages and age bands for treatment of fast breathing pneumonia by community health workers (CHWs) have not changed.

Recommendation 1

Children with fast breathing pneumonia with no chest indrawing or general danger sign should be treated with oral amoxicillin: at least 40mg/kg/dose twice daily (80mg/kg/day) for five days. In areas with low HIV prevalence, give amoxicillin for three days. Children with fast-breathing pneumonia who fail on first-line treatment with amoxicillin should have the option of referral to a facility where there is appropriate second-line treatment. (30,31).

Recommendation 2

Children age 2–59 months with chest in drawing pneumonia should be treated with oral amoxicillin: at least 40mg/kg/dose twice daily for five days.

Recommendation 3

Children aged 2–59 months with severe pneumonia should be treated with parenteral ampicillin (or penicillin) and gentamicin as a first-line treatment. — Ampicillin: 50 mg/kg, or benzyl penicillin: 50 000 units per kg IM/IV every 6 hours for at least five days — Gentamicin: 7.5 mg/kg IM/IV once a day for at least five days Ceftriaxone should be used as a second-line treatment in children with severe pneumonia having failed on the first-line treatment.

Recommendation 4

Ampicillin (or penicillin when ampicillin is not available) plus gentamicin or ceftriaxone are recommended as a first-line antibiotic regimen for HIV-infected and -exposed infants and for children under 5 years of age with chest indrawing pneumonia or severe pneumonia. For HIV-infected and -exposed infants and for children with chest indrawing pneumonia or severe pneumonia, who do not respond to treatment with ampicillin or penicillin plus gentamicin, ceftriaxone alone is recommended for use as second-line treatment.

Recommendation 5

Empiric cotrimoxazole treatment for suspected Pneumocystis jirovecii (previously Pneumocystis carinii) pneumonia (PCP) is recommended as an additional treatment for HIV-infected and -exposed

infants aged from 2 months up to 1 year with chest in drawing or severe pneumonia. Empirical cotrimoxazole treatment for Pneumocystis jirovecii pneumonia (PCP) is not recommended for HIV-infected and -exposed children over 1 year of age with chest indrawing or severe pneumonia.

COMPLICATIONS

Complication is due to the direct spread of bacterial infection in the thoracic cavity or bacteremia and hematologic spread. Meningitis, suppurative arthritis and osteomyelitis are rare complication of hematologic spread of pneumococcal or H.inluenza infection.

S.aureus, S.lpneumoniae, and S.pyogenes are the most common causes of parapneumonic effusions and empyema. Many such effusion are sterile. The treatment of empyema is based on the stage. USG and CT helps in determining the stage of pneumonia.

Treatment of empyema include antibiotic therapy and intercostal drainage. Other therapy includes intrapleural fibrinolytic therapy and selected video assisted thoracoscopy to debride or lyse adhesions and drain loculated areas of pus.

PREVENTION

Preventing pneumonia in children is an important component of a strategy to reduce child mortality. Immunization against Hemophilus

influenza, pneumococcus, measles and whooping cough (pertussis) is the most effective way to prevent pneumonia.

Adequate nutrition is the key in improving children's natural defences, starting with exclusive breastfeeding for the first 6 months of life. In addition to being effective in preventing pneumonia, it also helps to reduce the length of the illness and hospital stay if a child does become ill.

Addressing environmental factors such as indoor air pollution (by providing affordable clean indoor stoves, for example) and encouraging good hygiene in crowded homes also reduces the number of children who fall ill with pneumonia.

In children infected with HIV, the antibiotic cotrimoxazole is given daily to decrease the risk of contracting pneumonia.

BRONCHIOLITIS

Bronchiolitis is defined as an acute inflammatory injury of the bronchioles (29). It is predominantly a viral disease. RSV is responsible for more than 50% of cases.(31).other organisms include parainfluenza virus, adenovirus, mycoplasma and rhinovirus. Newly identified pathogens include human metapneumovirus and human bocavirus. It usually occurs in children of age group less than two years of age with the majority between three and six months (33)

Bronchiolitis is more common in boys than in girls. Breast feeding offers some protection against this disease. Various studies have showed a link between voluntary caesarean birth and an increased prevalence of bronchiolitis. Children born prematurely (less than 35 weeks), low birth weight or who are having congenital heart disease have higher rates of bronchiolitis and are more likely to require hospital admission. There are more chances for children living in crowded places. Older family members are also a common source of infection.

Infants with preexcisting smaller airways and diminished lung function have more severe manifestations. RSV causes a complex immune response. There is eosinophil degranulation and released eosinophil cationic protein is cytotoxic to airway epithelium. Innate immunity plays a significant role. Clinical manifestation is often altered by coinfection with more than one viruses.

CLINICAL MANIFESTATIONS

Acute bronchiolitis is usually preceded by exposure to a previous contact with a minor respiratory syndrome within previous week. Initial manifestations include sneezing and clear rhinorrhea. This is followed by clinical manifestations like tachypnea, hypoxemia from ventilation–perfusion mismatch, wheezing, crackles, and hyperinflation. The latter may be seen on physical examination or on the radiograph. Fever is often

present(38.5 to 39 degree Celsius). The complications of bronchiolitis include hypoxemia, respiratory failure, dehydration from decreased fluid intake, and apnea. The cause of the apnea is unclear, but it is more likely to occur in young infants who were born prematurely. RSV has a typical seasonal incidence. Children infected with HIV are likely to harbour the virus longer than other children. This can account for sporadic infection as the virus is transmitted to other children. Bronchiolitis typically starts with rhinorrhoea. After 2–3 days, cough and wheeze develop. The cough and wheeze clear in 7–14 days, though they may last up to 3–4 weeks in some children. On examination, the child is typically tachypneic with varying degrees of hypoxemia. The heart rate is usually elevated. The infant may have nasal flaring. Wheezes are the hallmark of the disease, from the intrathoracic airway obstruction. Crackles are heard as the inflammation obstructs the small airways. Subcostal retractions are a manifestation of hyperinflation. Increasing degrees of respiratory difficulty will cause intercostal retractions as well as accessory muscle use.

DIAGNOSIS

Diagnosis of acute bronchiolitis is clinical in infants presenting with first time wheezing. Chest x-ray shows hyperinflation with patchy atelectasis. The WBC and differential counts are usually normal. Viral

testing like polymerase chain reaction, rapid immunofluorescence and viral cultures are used for confirming the diagnosis.

TREATMENT

Infants with acute bronchiolitis experiencing respiratory distress, hypoxia, refusal of feeds, apnea, extreme tachypnea should be hospitalized. Risk factors for severe disease include age less than less than 12 weeks, preterm birth, underlying comorbidities like cardiovascular, pulmonary, neurologic or immunologic disease. The main stay of treatment is supportive. Hypoxemic children should receive humidified oxygen. Sedatives are usually avoided. If clinical features warrant intubation, oral feeds should be discontinued and put on intravenous fluids, There is more chance of aspiration in view of tachypnea.

Frequent suctioning of secretions are an important part of treatment. High flow nasal cannula therapy can reduce the need for intubation in children with impending respiratory failure.

Bronchodilators may provide short term improvement in clinical features. Corticosteroids are sometimes used inspite of conflicting results. Anti-viral agent ribavirin is administered by aerosol in infants with congenital heart disease. Nebulized hypertonic saline has some use and may shorten the hospital stay. Heliox delivered by tight fixing mask has some benefit in moderate to severe bronchiolitis.

PROGNOSIS

Infants with acute bronchiolitis are at risk of respiratory compromise in the first 72 hours of disease. Child may show features of air hunger, apnea, and respiratory acidosis. The case fatality rate is less than 1%. The mean duration of symptom in healthy infant is 2 weeks.10% can be symptomatic up to 3 weeks. There is higher incidence of asthma and wheezing in children with bronchiolitis

PREVENTION

Administration of pooled hyperimmune RSV intravenous immunoglobulin and palivizumab before and during RSV season can reduce the severity and incidence of acute bronchiolitis who are at risk. Palivizumab should be considered in children less than 2 years with chronic lung disease, prematurity and congenital heart disease

3. STUDY JUSTIFICATION

ARI is one of the leading cause of under 5 mortality globally. Various measures have been taken to prevent the incidents of pneumonia like vaccination, improving hygiene and exclusive breastfeeding . Reviewing the incidence and profile of pneumonia admissions in a tertiary care hospital will reflect the burden in the community and thereby helps to plan optimal use of resources and adopting proper preventive measures.

Various studies have showed that the morbidity and mortality due to pneumonia is more in children of age group less than 5 years. In this study admissions due to acute respiratory diseases in the age group 2 months to 5 years has been included. This study aims at identifying the incidents, various risk factors involved, morbidity and mortality, of acute respiratory infections in children of age group 2 months to 5 years.

4. AIM OF THE STUDY

The Study of Respiratory disease pattern in children of age group 2 months to 5 years age, admitted in Tertiary care Hospital, Tirunelveli Government Medical College and assess the various risk factors associated with ARI that determines the morbidity and mortality. Following parameters are considered to assess the risk factors, morbidity and mortality among the study group

1. Month of presentation
2. Sex
3. Immunization status
4. Socioeconomic status
5. History of exclusive breast feeding
6. Bad child rearing practises
7. Nutrition status
8. Need for ventilation, prolonged PICU and hospital stay
9. Outcome

5. MATERIALS AND METHODS

STUDY CENTRE

Our study was conducted at Department of Paediatrics, Tirunelveli Government Medical College, Tirunelveli, Tamilnadu

STUDY GROUP

All cases of acute respiratory diseases between the age group of 2 months to 5 years admitted during the period from 1/1/16 to 1/6/17 in paediatric department of Tirunelveli Government medical college

STUDY DESIGN

Prospective Observational study

STUDY DURATION

January 2016 to June 2017

All children admitted as in patients during the study period were included for denominator to study the incidence of acute respiratory disease.

INCLUSION CRITERIA

All children in the age group of 2 months to 5 years admitted with acute respiratory diseases like pneumonia, bronchiolitis, bronchitis, WALRI (wheeze Assosiated Lower Respiratory Tract Infection), croup are included.

EXCLUSION CRITERIA

1. Respiratory complication due to other causes like congenital heart disease, neurological diseases.
2. Foreign body aspiration
3. Poisoning, chemical pneumonitis
4. Drowning
5. Inborn Error of Metabolism
6. Metabolic causes
7. Immunosuppressive conditions

The children of those parents who did not give consent to undergo study was excluded.

METHODOLOGY

Pre structured proforma was used to obtain information from the parents. After getting the consent, detailed history, clinical details and investigations were collected and entered in the proforma. It includes age, sex, details regarding birth weight, order of birth, prenatal and post natal history.

History regarding exclusive breast feeding up to 6 months, details of weaning and complimentary feeding, nutritional history by 24 hour recall method before the onset of illness were taken . Lack of exclusive breast feeding was considered in those cases who started giving formula feeding, cow milk or complimentary feeding before 6 months of age. Nutritional status assessed using WHO Z score weight for Age. WHO weight for age less than -2 Z score is considered as a risk factor in this study.

Detailed history regarding bad child rearing practises were noted, it includes bottle feeding, nose blowing, ear blowing, giving herbal and other medicines without proper prescription.

Details regarding immunization was taken from parents and immunization card. BCG scar was noted

Detailed family history was taken regarding parental smoking, family size, maternal education and paternal occupation, overcrowding,

type of fuel for cooking. Socio economic status was assessed using modified Kuppusamy scale.

Details regarding preceding history of diarrhoea, measles, ASOM were noted. Details regarding H/o allergy, family history of asthma, recurrent respiratory infections, pet animals at home, previous h/o nebulisation were all noted.

Clinical features were recorded. It included temperature recording, oxygen saturation using pulse oxymetry, Respiratory rate in minute, chest in drawing, grunting, nasal flaring, crepitations, wheeze, stridor, cyanosis, lethargy, level of sensorium, dehydration, sepsis, shock and need for ventilation.

Morbidity was assessed in the form of need for ventilation, prolonged PICU stay and hospital stay. Prolonged stay was defined as stay for more than 7 days in this study.

Various investigations were done that aid in proper diagnosis like complete blood count(CBC), CRP and culture. Mantoux and HIV screening were done for selected cases.

Chest X-ray was taken in all cases. CT chest and USG thorax were taken in selected cases for assessing complications.

The study subjects were classified as pneumonia, Sever pneumonia, Very severe pneumonia, Bronchiolitis, WALRI and Croup were diagnosed according to history, clinical features and laboratory investigations

STATISTICAL ANALYSIS

Data collected and recorded in the proforma during the whole study period were entered in Microsoft Excel Sheet and statistically analysed using IBM SPSS version 22.0, to identify whether various risk factors for morbidity and mortality of ARI cases are statistically significant.

6. RESULTS

PREVALANCE AMONG ALL INPATIENTS			
INPATIENTS	**TOTAL**	**RESP INF**	**PREVALENCE**
MALE	1678	186	11%
FEMALE	1115	120	10.70%
TOTAL	2793	306	10.95%

TABLE 1

The prevalence of respiratory infection in last one and half year among inpatients is 11% among males and 10.70% among females.

AGE DISTRIBUTION

AGE (IN MONTHS)	NO OF PATIENTS	PERCENTAGE
2 MON - 6 MON	61	20%
7 MON - 1 YEAR	72	23.50%
1-3 YEAR	93	30.3%
4-5 YEAR	80	26.2%

TABLE 2

Among admissions 43.5% is constituted by infants

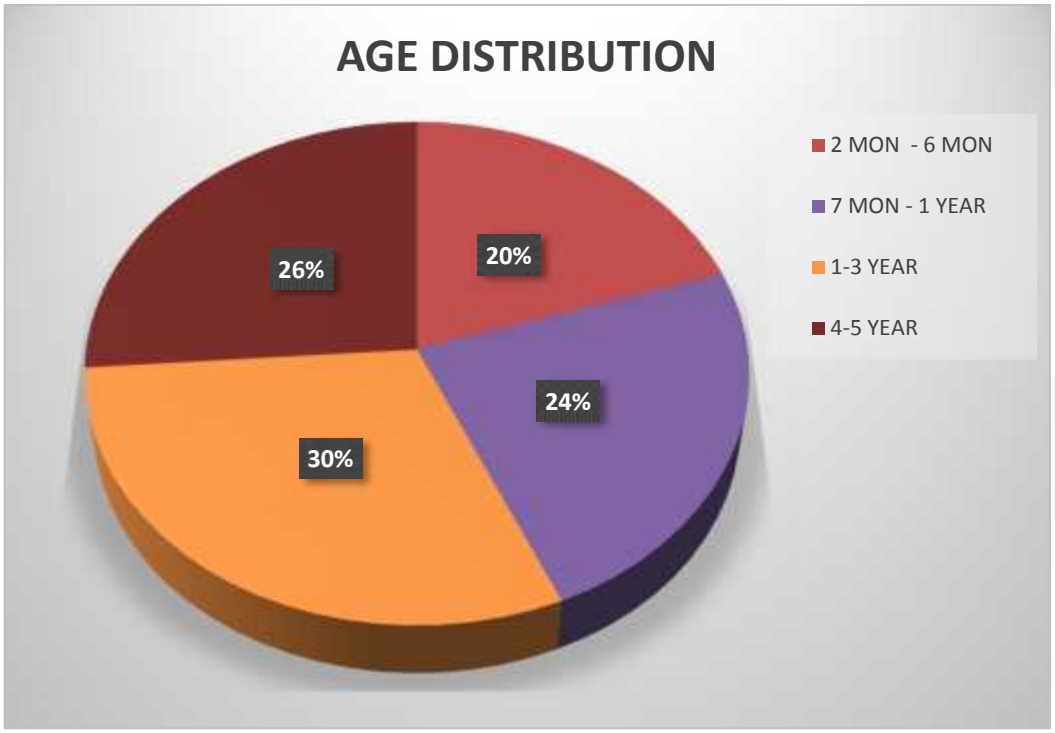

Diagram 1

DIAGNOSIS

DIAGNOSIS	NO OF PATIENTS	PERCENTAGE
BRONCHIOLITIS	47	15.30%
CROUP	15	5%
WALRI	43	14%
PNEUMONIA	117	38.50%
SEVERE PNEUMONIA	45	14.70%
VERY SEVERE PNEUMONIA	39	12.50%

Table 3

Pneumonia is the most common diagnosis among patient with respiratory infection.It constitute 38.5%.It is followed by bronchiolitis which constitute 15.3% of total admissions.

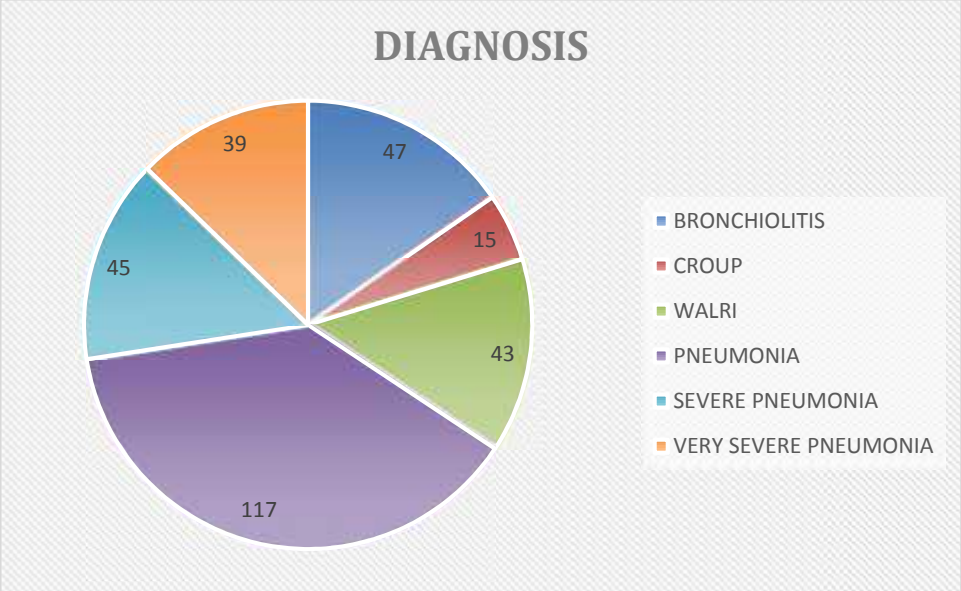

Diagram 2

OUTCOME

Of the total admissions 5.90% patients died.

OUTCOME	NO OF PATIENTS	PERCENTAGE
DEATH	18	5.90%
ALIVE	288	94.10%

Table 4

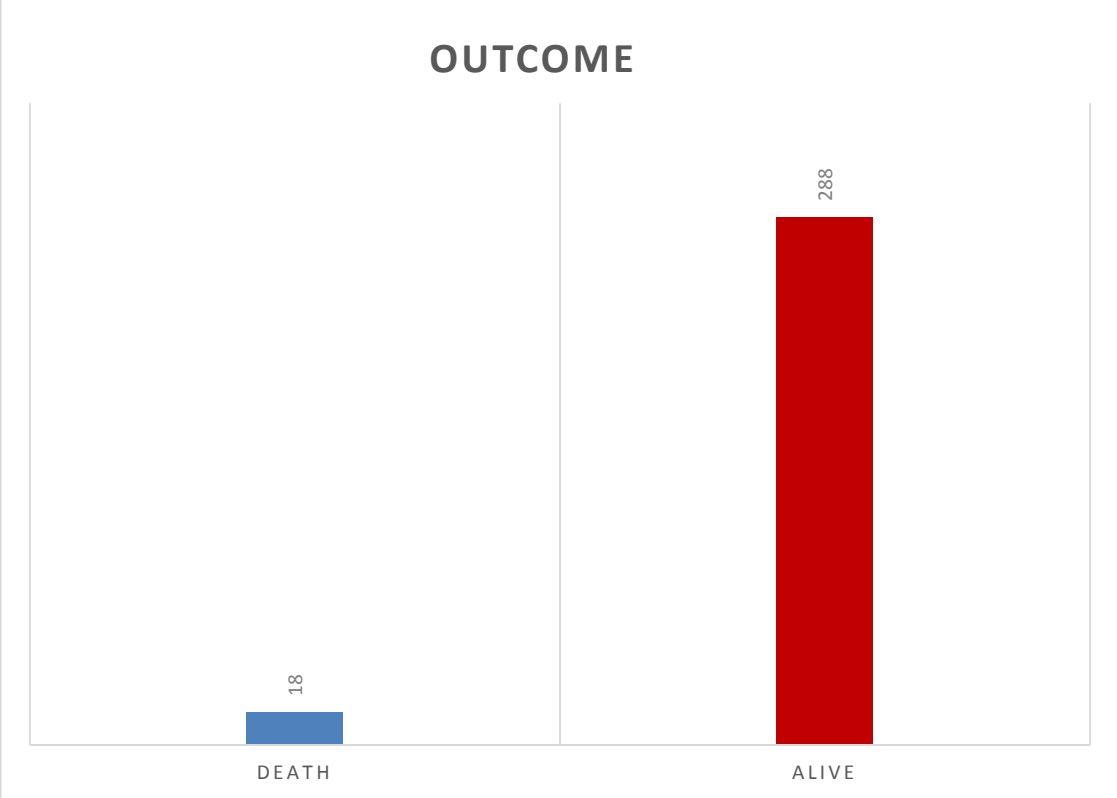

Diagram 3

MEAN AGE OF DIAGNOSIS

	AGE IN MONTHS	
DIAGNOSIS	MEAN	SD
BRONCHIOLITIS	11.85	4.3
CROUP	27.33	8.5
WALRI	39.51	9.6
PNEUMONIA	22.78	19
SEVERE PNEUMONIA	19.49	17.3
VERY SEVERE PNEUMONIA	16.23	4.51
P VALUE - 0.001		
SIGNIFICANT		
ANOVA		

Table 5

There is significant difference in mean age of different diagnosis. The mean age of diagnosis of pneumonia is 22.78 months , severe pneumonia is19.49 months ,very severe pneumonia is 16.23 months and bronchiolitis , it is 11.85 months.

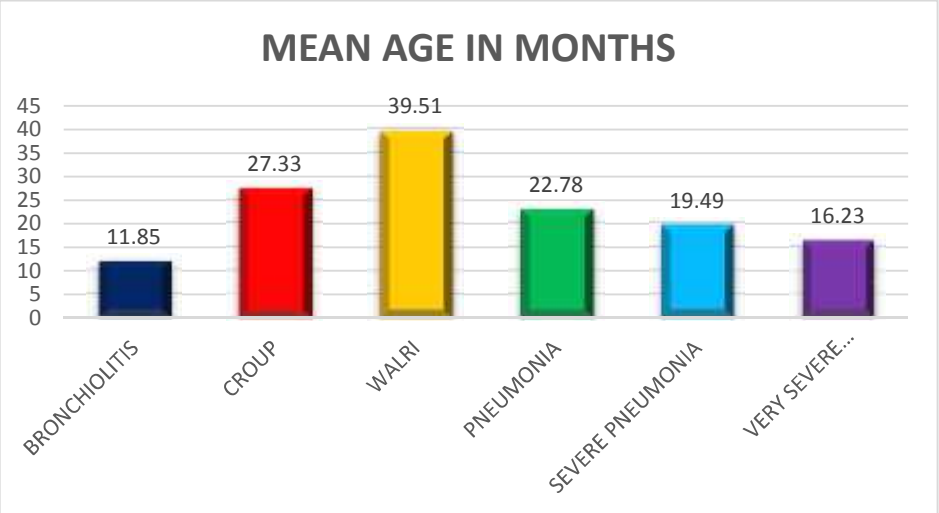

Diagram 4

DIAGNOSIS Vs AGE

	AGE			
DIAGNOSIS	**2 - 6 MON**	**7 MON - 1 YEAR**	**1-3 YEAR**	**4-5 YEAR**
BRONCHIOLITIS	8	18	21	0
CROUP	0	1	12	
WALRI	0	0	15	28
PNEUMONIA	30	25	30	18
SEVERE PNEUMONIA	12	15	6	12
VERY SEVERE PNEUMONIA	11	13	9	6
P VALUE - 0.012				
SIGNIFICANT				
KRUSKAL WALLIS TEST				

Table 6

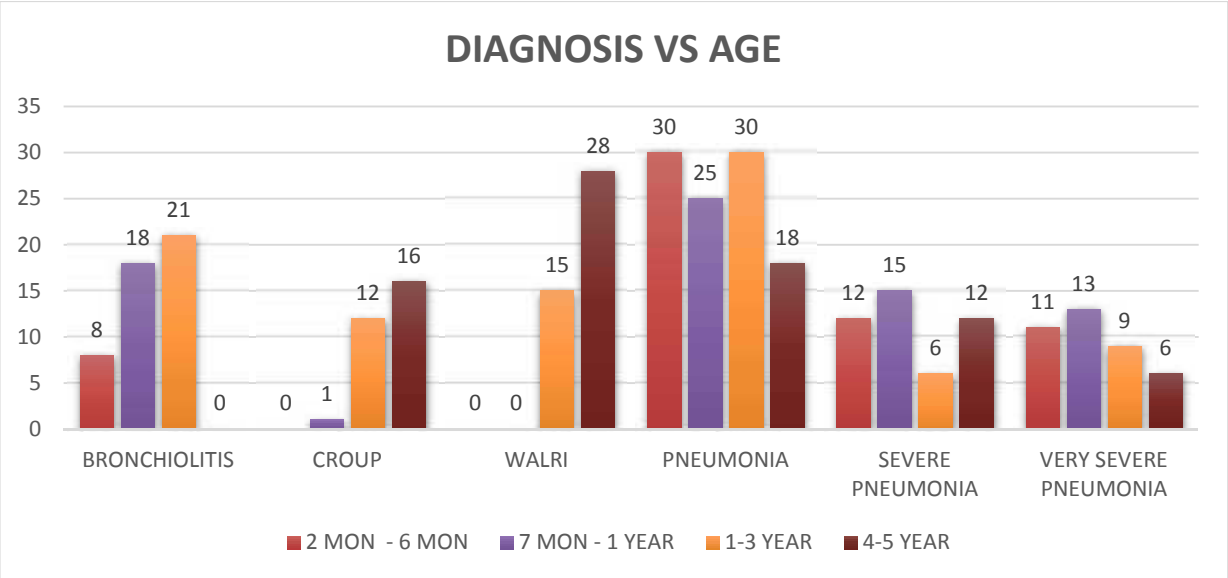

Diagram 5

OUTCOME Vs AGE

	AGE			
OUTCOME	**2 - 6 MON**	**7 MON - 1 YEAR**	**1-3 YR**	**4-5 YR**
DEATH	4	3	8	3
ALIVE	57	69	85	77
P VALUE - 0.512				
NON SIGNIFICANT				
KRUSKAL WALLIS TEST				

Table 7

There is no significant impact of age over outcome of the respiratory infection with P value – 0.512

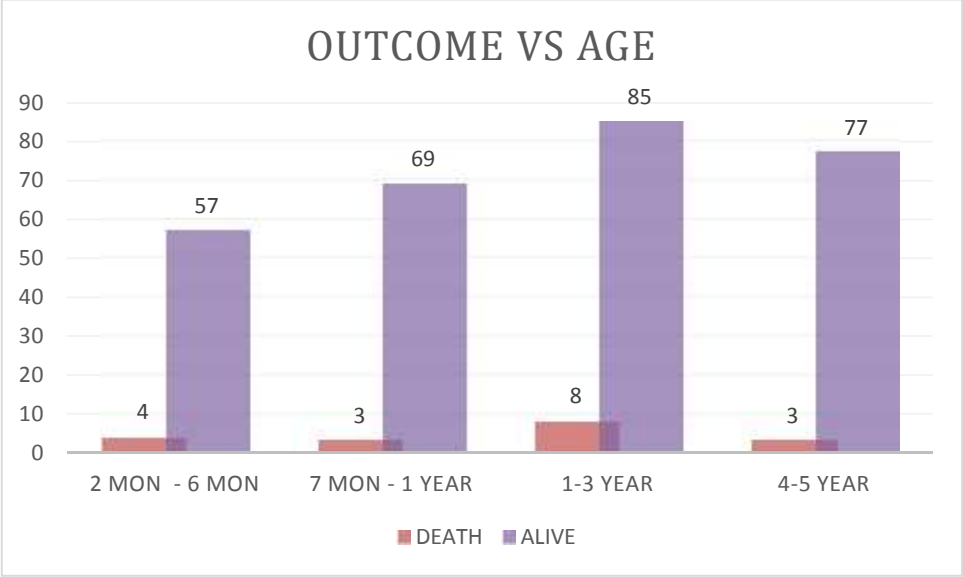

Diagram 6

SEX DISTRIBUTION

SEX	NO OF PATIENTS	PERCENTAGE
MALE	186	61%
FEMALE	120	39%

Table 8

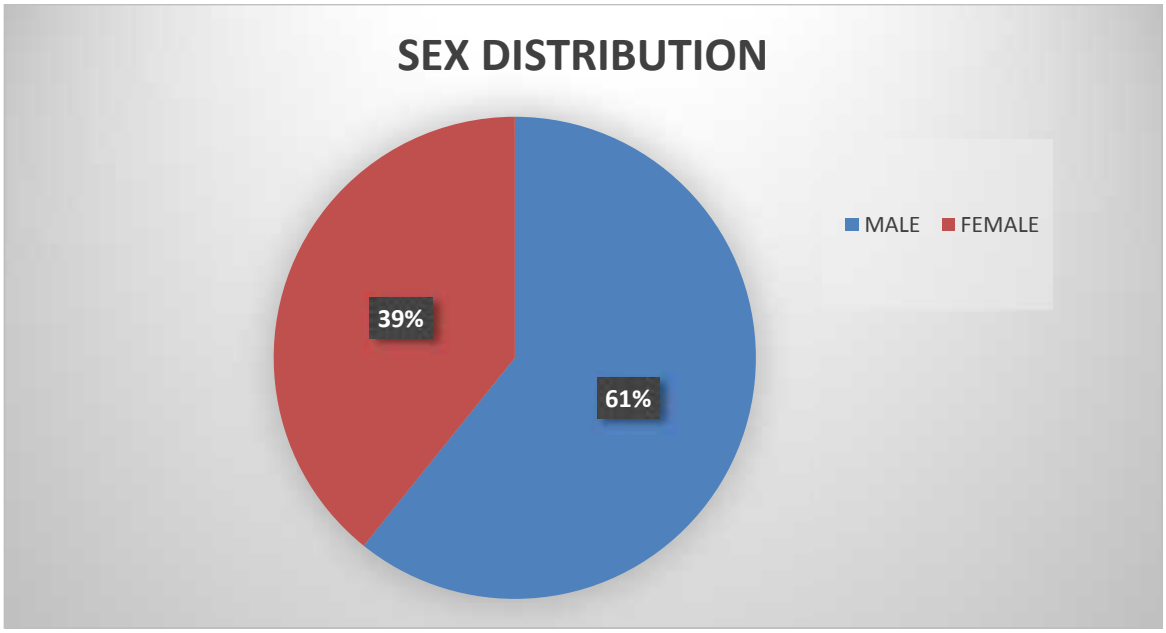

Diagram 7

SEX Vs DIAGNOSIS

	SEX	
DIAGNOSIS	**MALE**	**FEMALE**
BRONCHIOLITIS	27	20
CROUP	8	7
WALRI	25	18
PNEUMONIA	79	38
SEVERE PNEUMONIA	24	21
VERY SEVERE PNEUMONIA	23	16
P VALUE - 0.546		
NON SIGNIFICANT		
KRUSKAL WALLIS TEST		

Table 9

There is no significant influence of sex over diagnosis with P value of 0.546.

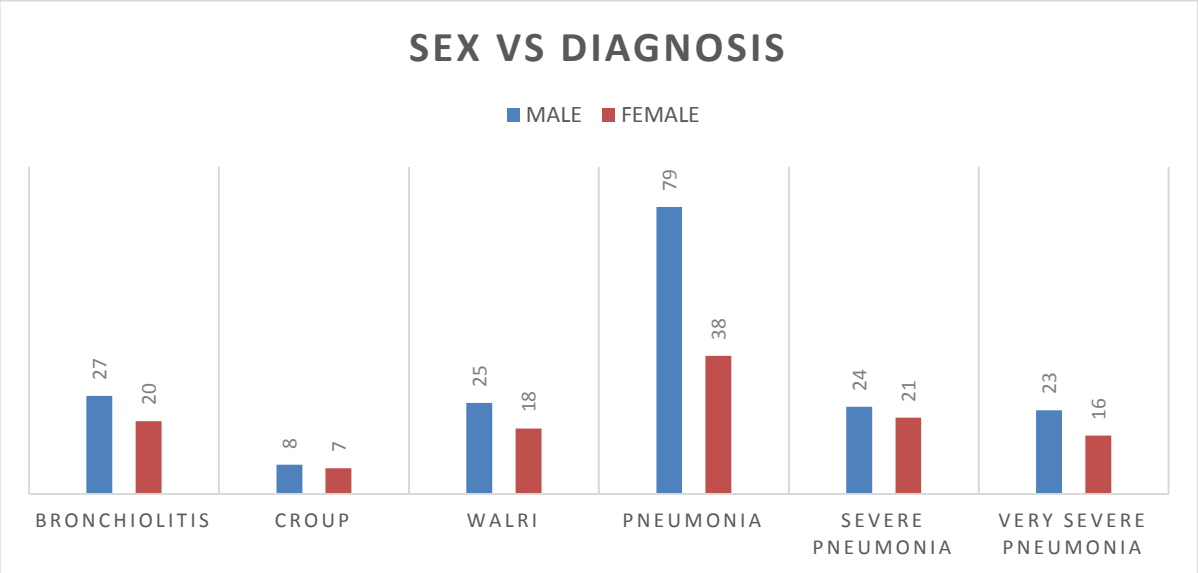

Diagram 8

SEX Vs OUTCOME

	SEX	
OUTCOME	**MALE**	**FEMALE**
DEATH	8	10
ALIVE	178	110
CHI SQUARE TEST		
P VALUE - 0.143		
ODDS RATIO - 0.643		
NON SIGNIFICANT		

Table 10

There is no significant influence of sex over outcome with P value of 0.143

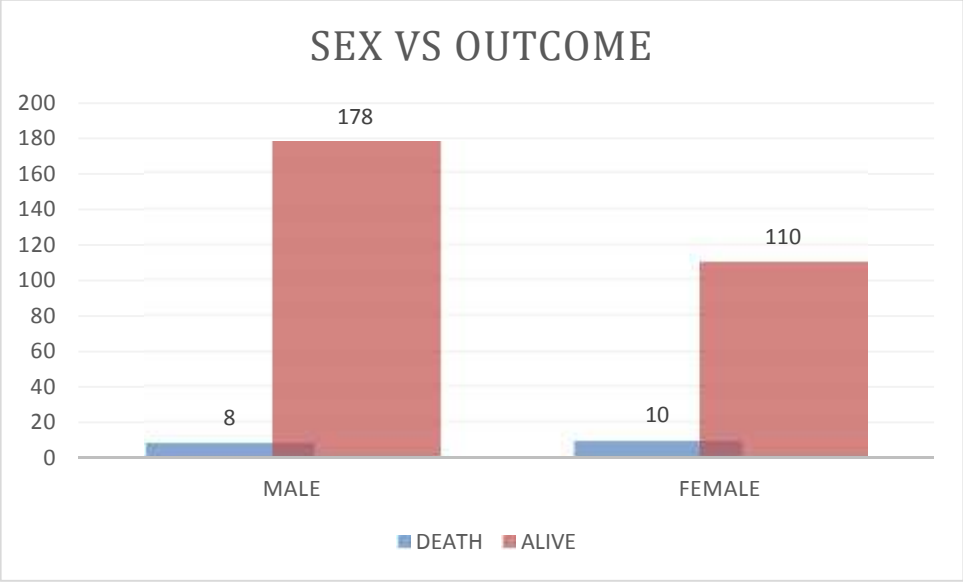

Diagram 9

EXCLUSIVE BREAST FEEDING

EXCLUSIVE BREAST FEED-6 M	NO OF PATIENTS	PERCENTAGE
YES	173	57%
NO	133	43%

Table 11

57% of the admitted children were exclusively breast fed

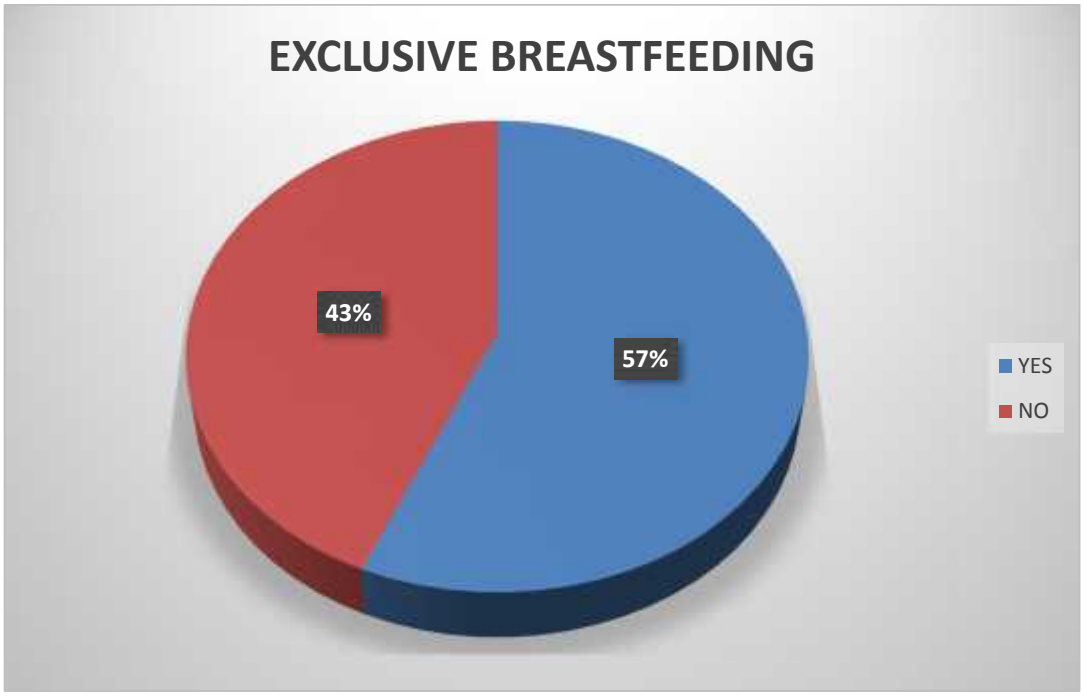

Diagram 10

EBF Vs DIAGNOSIS

	EXCLUSIVE BREAST FEED-6 M	
DIAGNOSIS	**YES**	**NO**
BRONCHIOLITIS	25	22
CROUP	7	8
WALRI	29	14
PNEUMONIA	79	38
SEVERE PNEUMONIA	18	27
VERY SEVERE PNEUMONIA	15	24
P VALUE - 0.002		
SIGNIFICANT		
KRUSKAL WALLIS TEST		

Table 12

There is significant influence of presence or absence of exclusive breast feeding over diagnosis with P value of 0.002 particularly severe and very severe pneumonia is more in patients who were not under exclusive breast feeding.

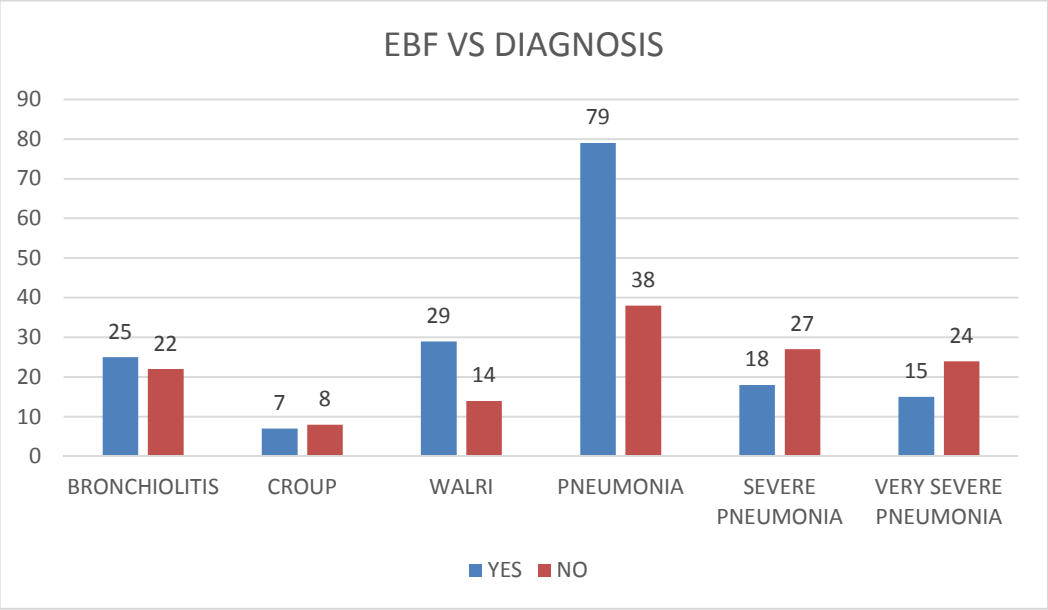

Diagram 11

EBF Vs OUTCOME

	EXCLUSIVE BREAST FEED-6 M	
OUTCOME	**NO**	**YES**
DEATH	12	6
ALIVE	121	167
CHI SQUARE TEST		
P VALUE - 0.041		
ODDS RATIO - 2.36		
SIGNIFICANT		

Table 13

There is significant influence of presence or absence of exclusive breast feeding over outcome of disease with P value of 0.041. Patients died were more in group who were not under exclusive breast feeding.

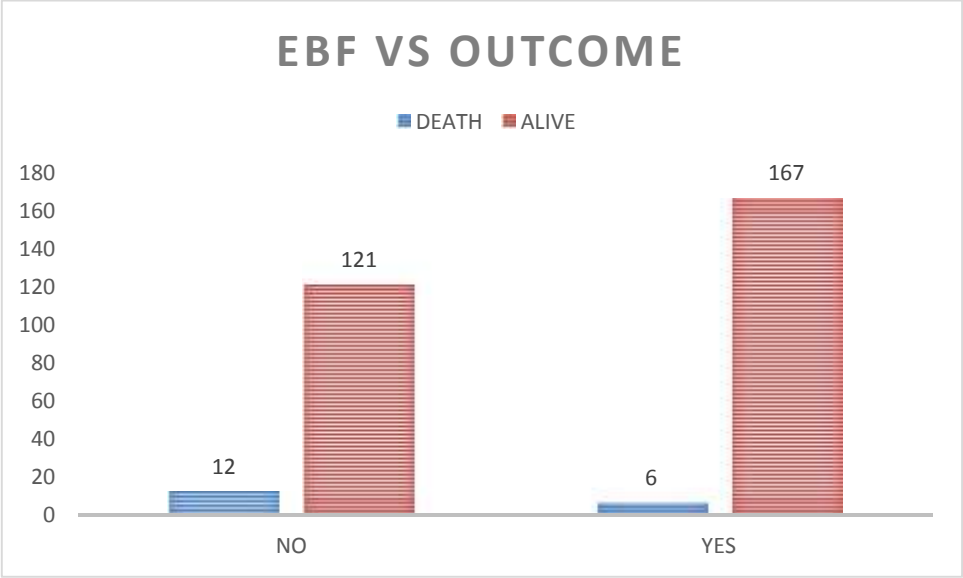

Diagram 12

SOCIO ECONOMIC STATUS STAGE 4 AND 5

SOCIO ECONOMIC STATUS 4&5	NO OF PATIENTS	PERCENTAGE
YES	243	80%
NO	63	20%

Table 14

80 % of the study population belongs to socio economic status stage 4 or 5

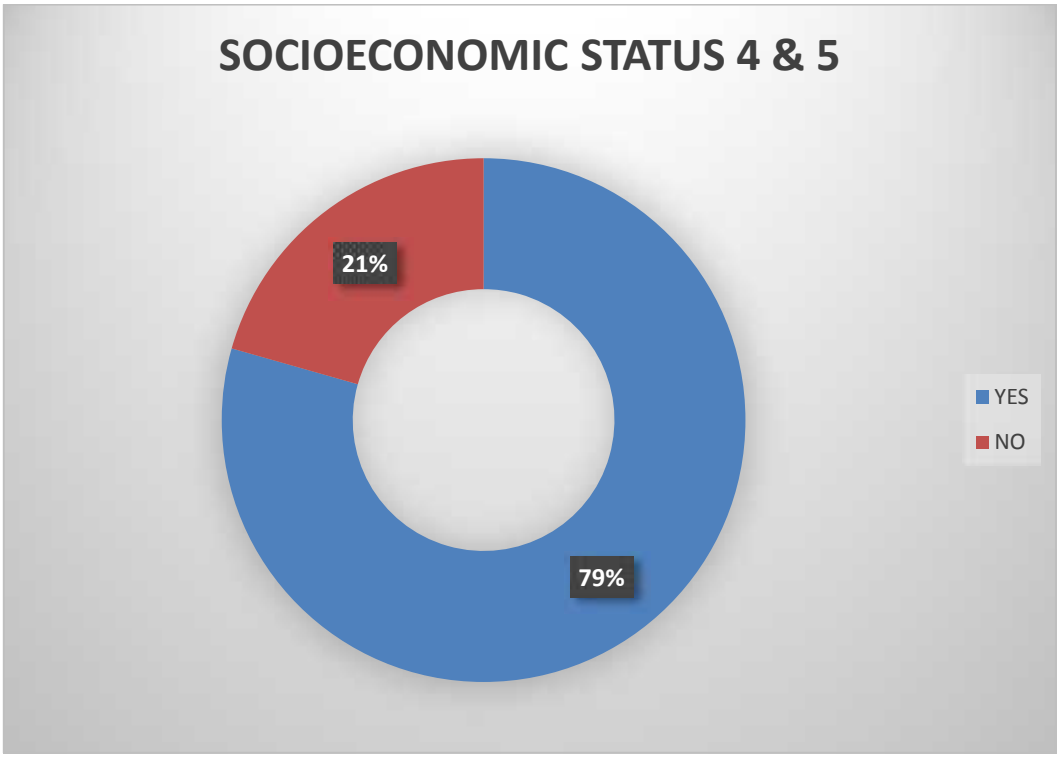

Diagram 13

SOCIO ECONOMIC STATUS 4 AND 5 Vs DIAGNOSIS

	SOCIO ECONOMIC STATUS 4&5	
DIAGNOSIS	**YES**	**NO**
BRONCHIOLITIS	40	7
CROUP	11	4
WALRI	32	11
PNEUMONIA	83	34
SEVERE PNEUMONIA	38	7
VERY SEVERE PNEUMONIA	39	0
P VALUE - 0.003		
SIGNIFICANT		
KRUSKAL WALLIS TEST		

Table 15

There is significant influence of presence socioeconomic status 4&5 over diagnosis with P value of 0.003, particularly severe and very severe pneumonia is more in patients who were in SES 4 & 5.

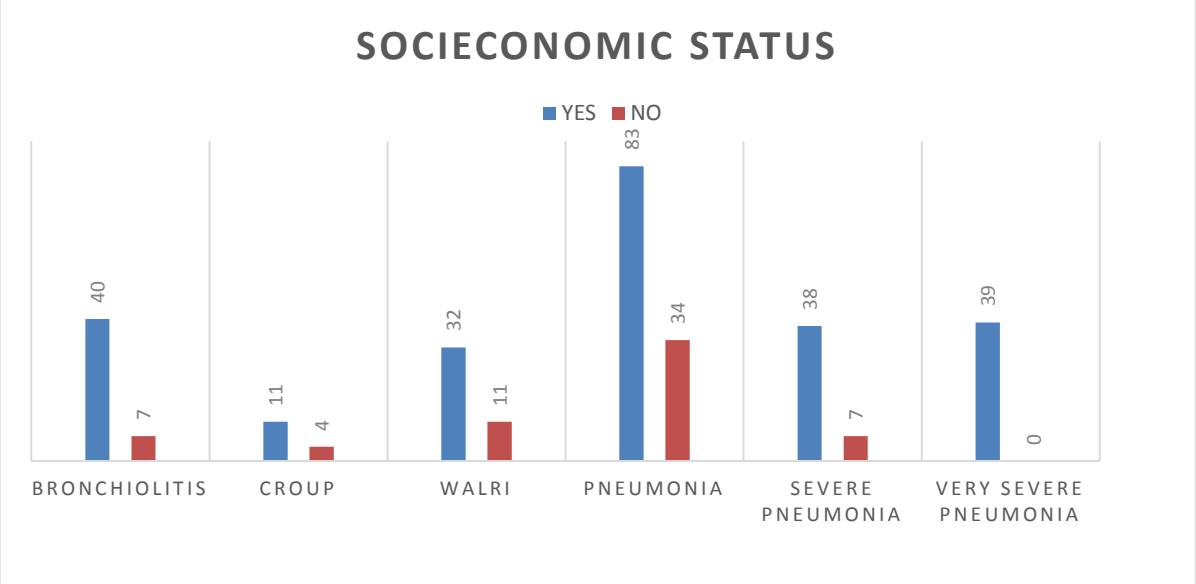

Diagram 14

OUTCOME Vs SOCIO ECONOMIC STATUS 4 AND 5

	SOCIO ECONOMIC STATUS 4&5	
OUTCOME	YES	NO
DEATH	18	0
ALIVE	225	63
CHI SQUARE TEST		
P VALUE - 0.026		
ODDS RATIO - 1.20		
SIGNIFICANT		

Table 16

There is significant influence of presence or absence of socioeconomic status 4 &5 over outcome of disease with P value of 0.026.

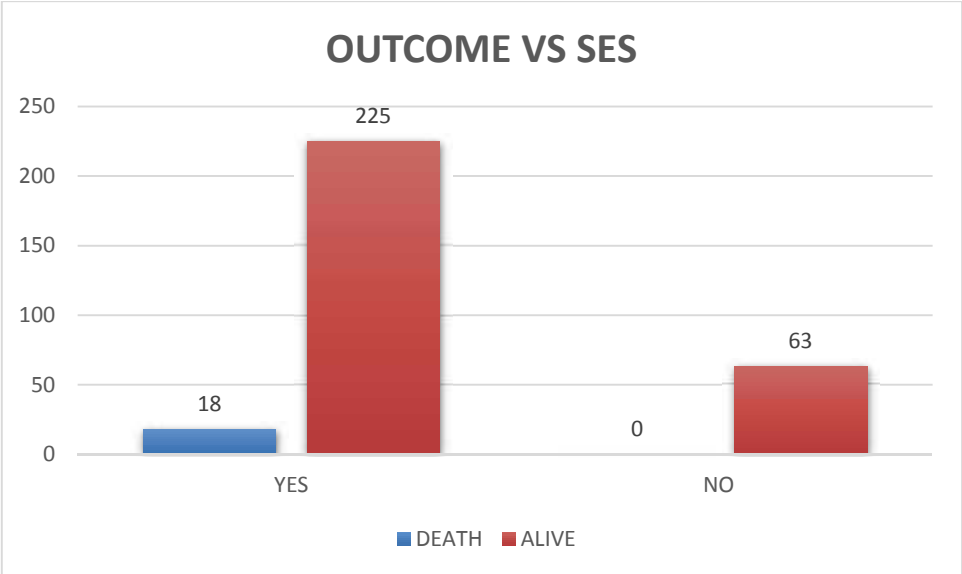

Diagram 15

IMMUNISATION STATUS

IMMUNISATION TO AGE	NO OF PATIENTS	PERCENTAGE
DONE	225	74%
NOT DONE	81	26%

Table 17

74 % of the admitted children were immunised for age

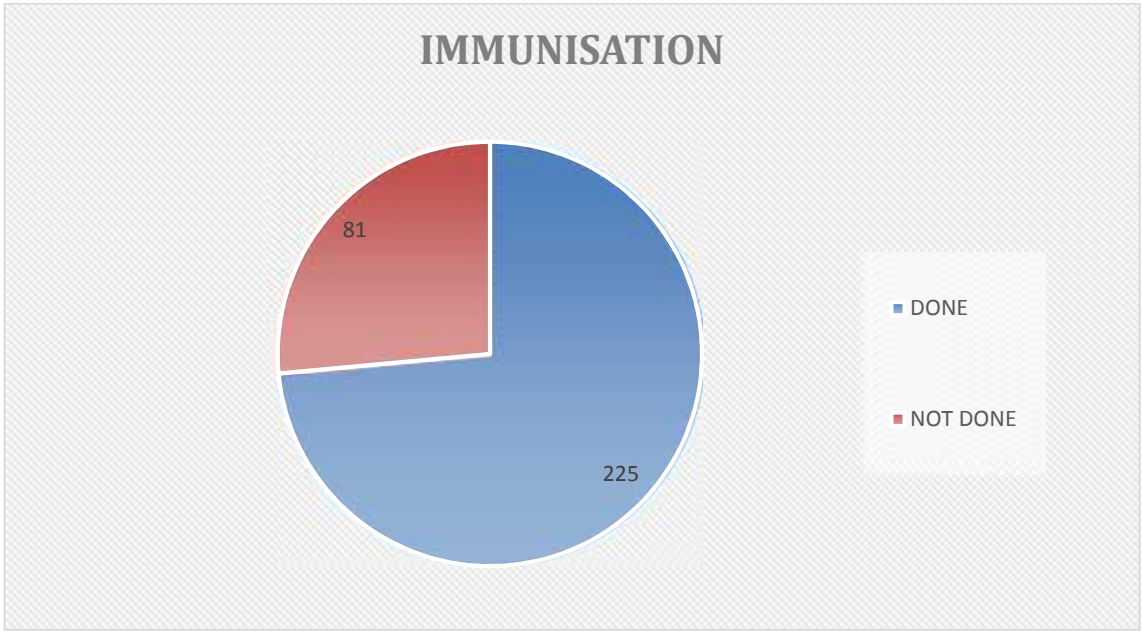

Diagram 16

DIAGNOSIS Vs IMMUNISATION

	IMMUNISATION TO AGE	
DIAGNOSIS	**DONE**	**NOT DONE**
BRONCHIOLITIS	32	15
CROUP	8	7
WALRI	20	23
PNEUMONIA	104	13
SEVERE PNEUMONIA	31	14
VERY SEVERE PNEUMONIA	30	9
P VALUE - 0.001		
SIGNIFICANT		
KRUSKAL WALLIS TEST		

Table 18

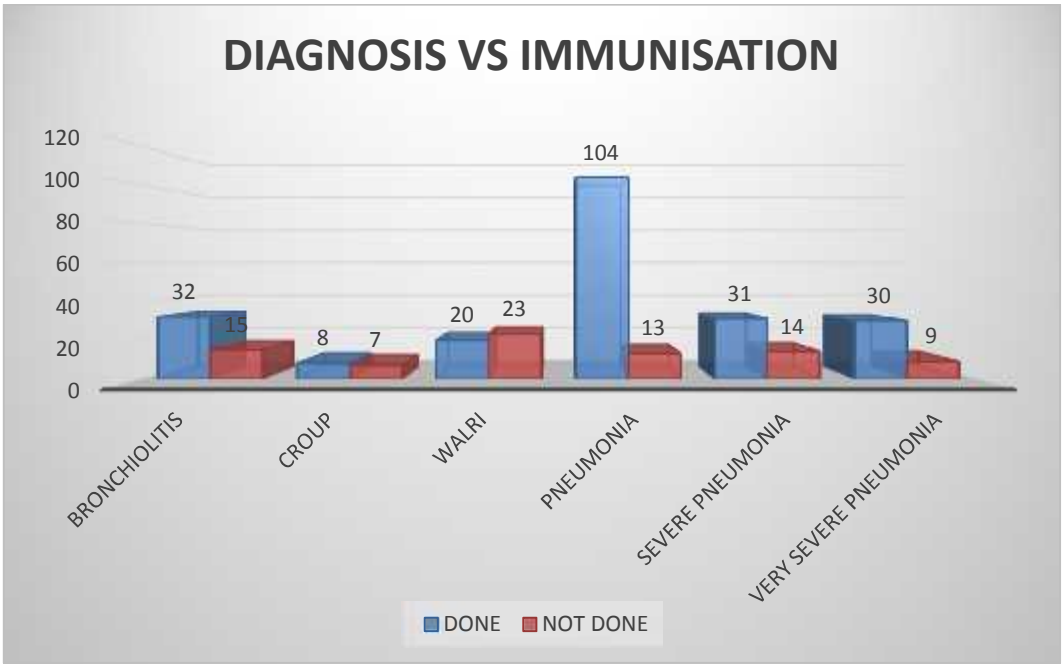

Diagram 17

There is significant influence of immunization over diagnosis with P value of 0.001.

IMMUNISTAION VS OUTCOME

	IMMUNISATION TO AGE	
OUTCOME	**NOT DONE**	**DONE**
DEATH	5	13
ALIVE	76	212
CHI SQUARE TEST		
P VALUE - 0.896		
ODDS RATIO - 1.07		
NON SIGNIFICANT		

Table 19

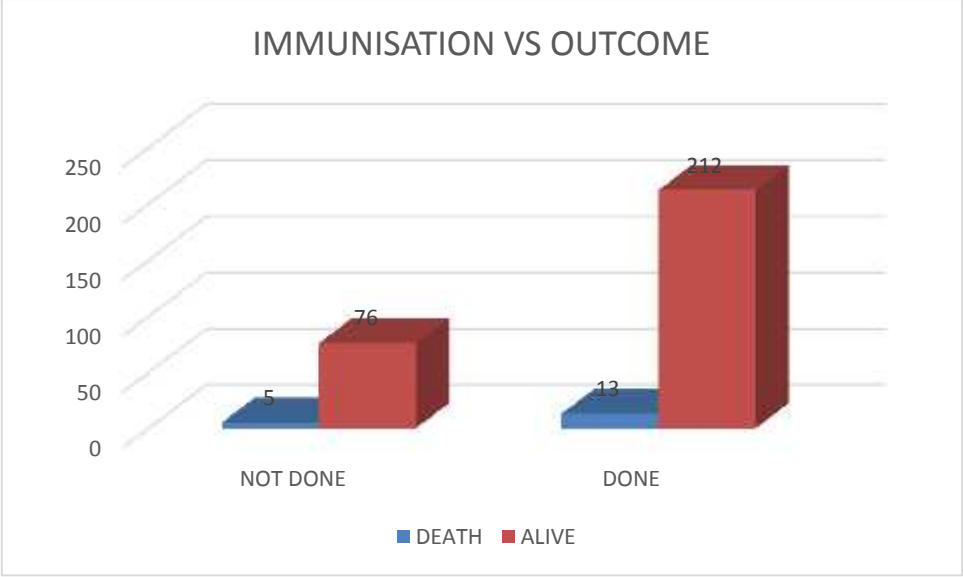

Diagram 18

There is no significant influence of immunisation over outcome of disease with P value of 0.896.

BAD CHILD REARING PRACTICES

BAD CHILD REARING PRACTICE	NO OF PATIENTS	PERCENTAGE
YES	131	43%
NO	175	57%

Table 20

43 % of admissions had history of bad child rearing practises

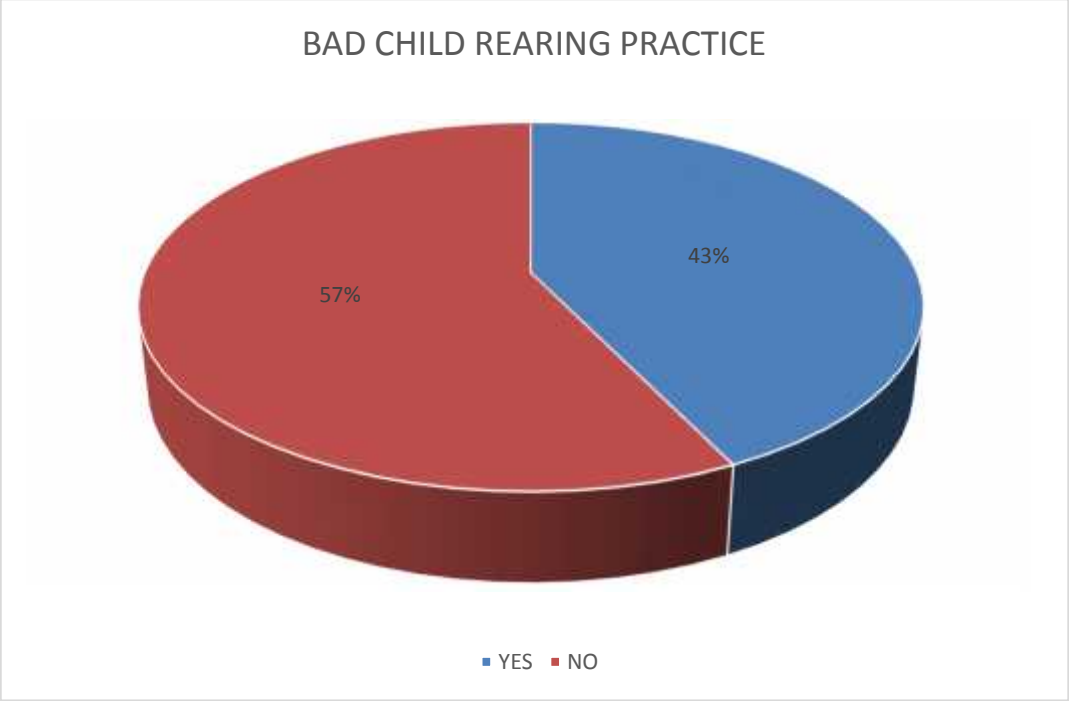

Diagram 19

BAD CHILD REARING PRACTICE Vs DIAGNOSIS

	BAD CHILD REARING PRACTICE	
DIAGNOSIS	**YES**	**NO**
BRONCHIOLITIS	20	27
CROUP	11	4
WALRI	20	23
PNEUMONIA	31	86
SEVERE PNEUMONIA	28	17
VERY SEVERE PNEUMONIA	21	18
P VALUE - 0.001		
SIGNIFICANT		
KRUSKAL WALLIS TEST		

Table 21

There is significant influence of bad child rearing practice over diagnosis with P value of 0.001.

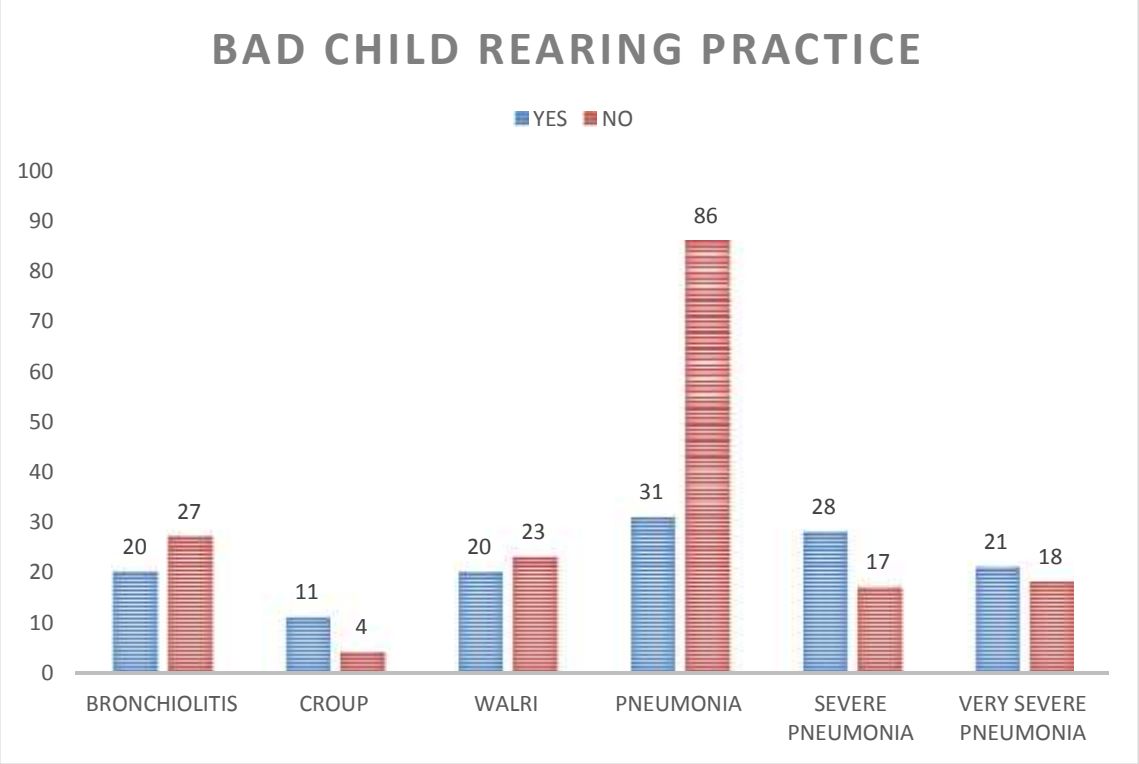

Diagram 20

BAD CHILD REARING PRACTICE Vs OUTCOME

	BAD CHILD REARING	
OUTCOME	**YES**	**NO**
DEATH	6	12
ALIVE	125	163
CHI SQUARE TEST		
P VALUE - 0.402		
ODDS RATIO - 0.652		
NON SIGNIFICANT		

Table 22

There is no significant influence of bad child rearing practice over outcome of disease with P value of 0.402.

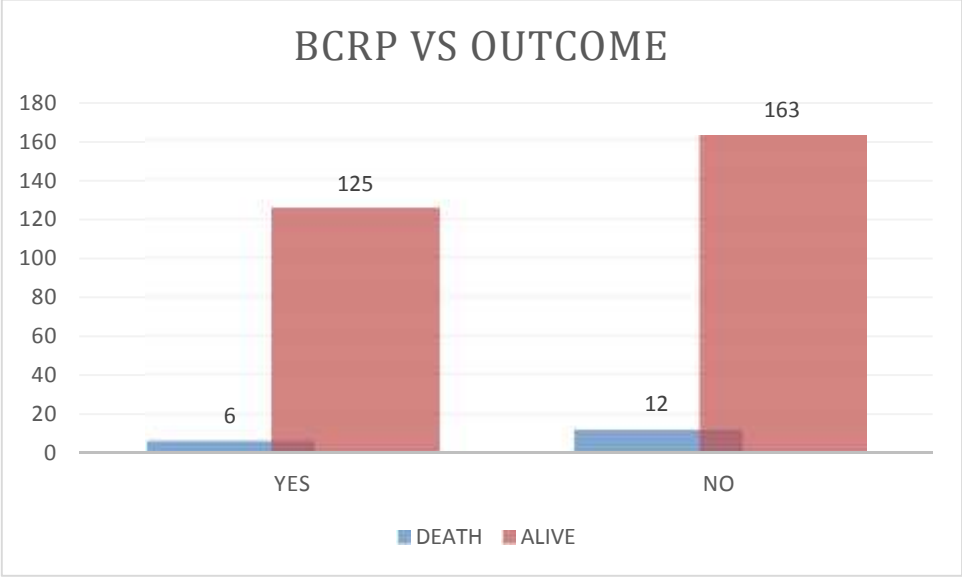

Diagram 21

SEPSIS

SEPSIS	NO OF PATIENTS	PERCENTAGE
PRESENT	43	14%
ABSENT	263	86%

Table 23

14% of admitted cases had evidence of sepsis

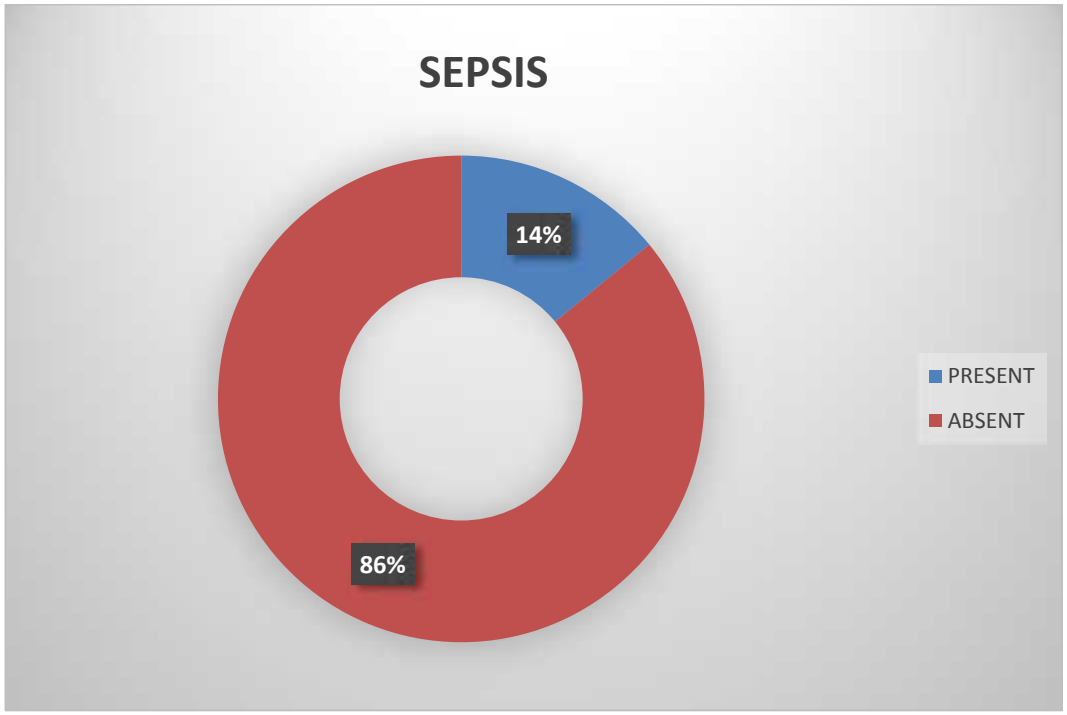

Diagram 22

SEPSIS Vs DIAGNOSIS

	SEPSIS	
DIAGNOSIS	**PRESENT**	**ABSENT**
BRONCHIOLITIS	4	43
CROUP	0	15
WALRI	0	43
PNEUMONIA	1	116
SEVERE PNEUMONIA	3	42
VERY SEVERE PNEUMONIA	35	4
P VALUE - 0.001		
SIGNIFICANT		
KRUSKAL WALLIS TEST		

Table 24

There is significant influence of presence of sepsis over diagnosis with P value of 0.001 particularly very severe pneumonia.

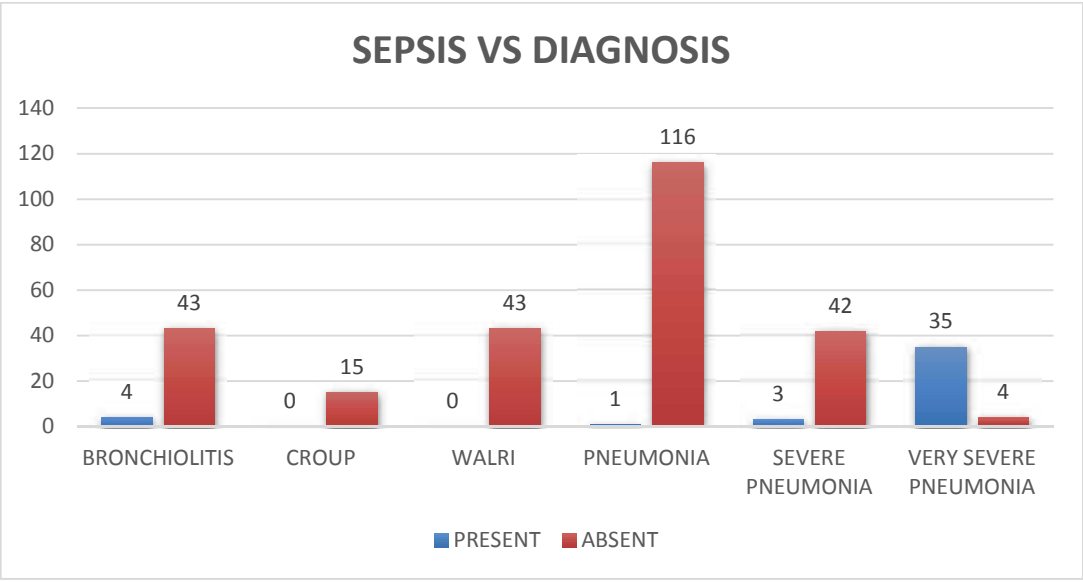

Diagram 23

SEPSIS Vs OUTCOME

	SEPSIS	
OUTCOME	**PRESENT**	**ABSENT**
DEATH	18	0
ALIVE	25	263
CHI SQUARE TEST		
P VALUE - 0.001		
ODDS RATIO - 11.52		
SIGNIFICANT		

Table 25

There is significant influence of presence or absence of sepsis over disease outcome with P value of 0.001 and odds ratio of 11.52 which shows patient with sepsis has 12 time more chance if mortality.

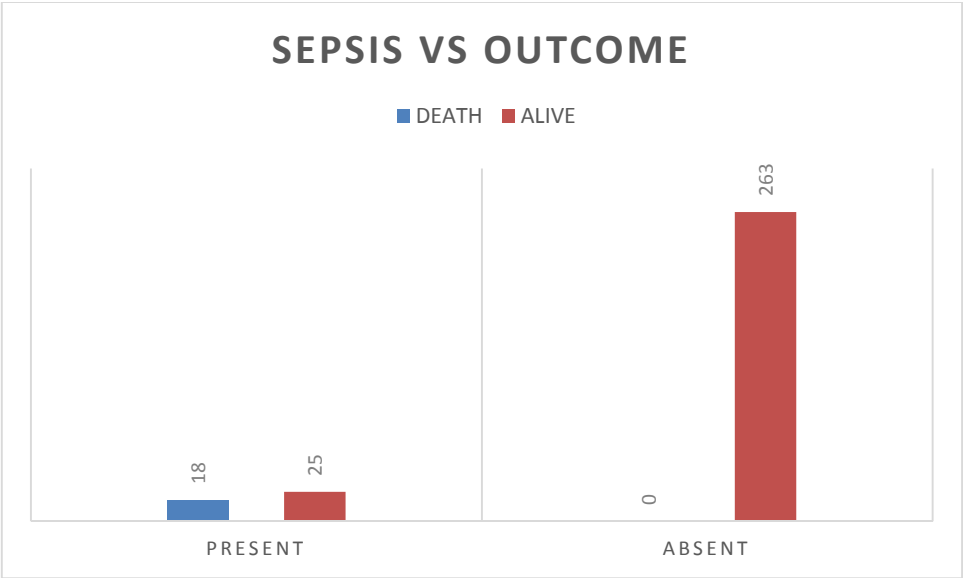

Diagram 24

MALNUTRITION

MALNUTRITION	NO OF PATIENTS	PERCENTAGE
PRESENT	82	27%
ABSENT	224	73%

Table 26

Of the total admissions 27% of children has weight for age Z score < -2

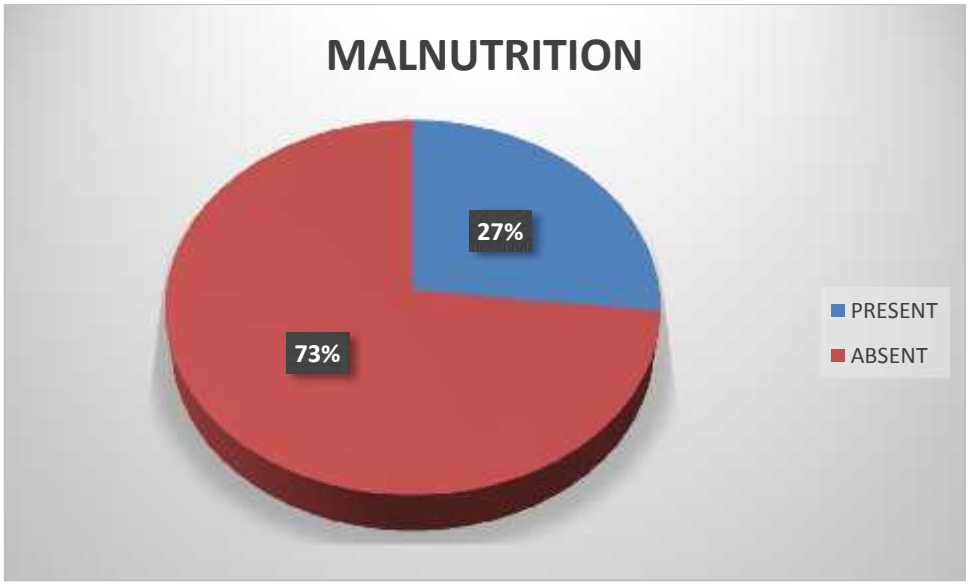

Diagram 25

MALNUTRITION VS DIAGNOSIS

	MALNUTRITION	
DIAGNOSIS	**PRESENT**	**ABSENT**
BRONCHIOLITIS	12	35
CROUP	4	11
WALRI	9	34
PNEUMONIA	3	114
SEVERE PNEUMONIA	25	20
VERY SEVERE PNEUMONIA	29	10
P VALUE - 0.001		
SIGNIFICANT		
KRUSKAL WALLIS TEST		

Table 27

There is significant influence of presence or absence of malnutrition over diagnosis with P value of 0.001 particularly severe and very severe pneumonia is more in patients who were under malnutrition.

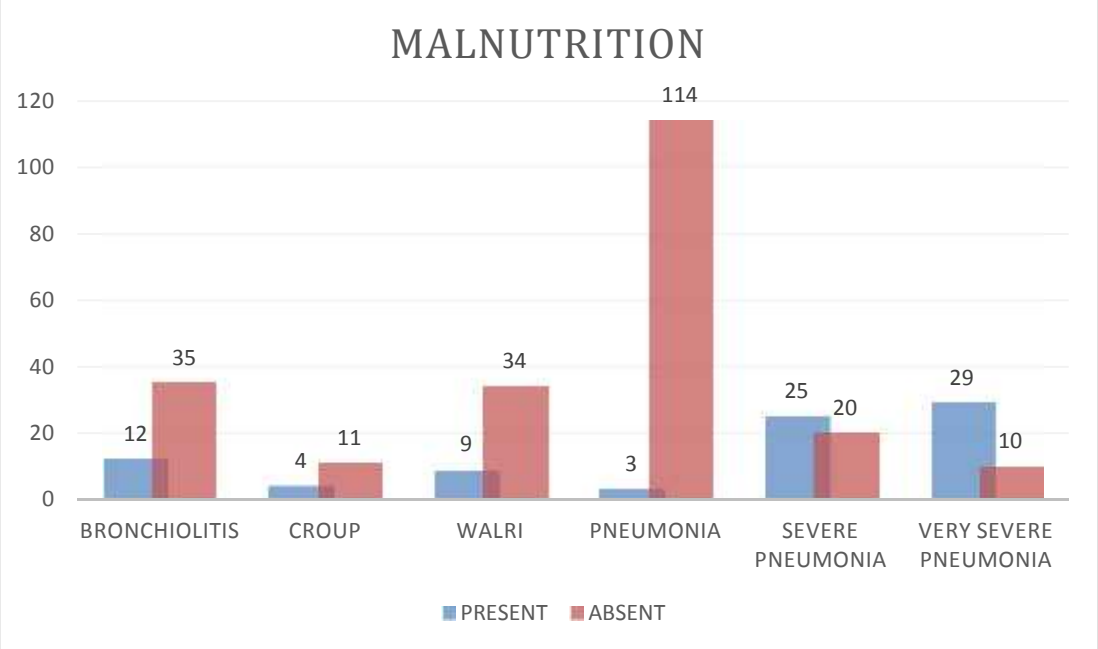

Diagram 26

MALNUTRITION VS OUTCOME

	MALNUTRITION	
OUTCOME	**PRESENT**	**ABSENT**
DEATH	14	4
ALIVE	68	220
CHI SQUARE TEST		
P VALUE - 0.001		
ODDS RATIO - 11.32		
SIGNIFICANT		

Table 28

There is significant influence of presence or absence of malnutrition over disease outcome with P value of 0.001.Patient with malnutrition has 11 time more chance of mortality.

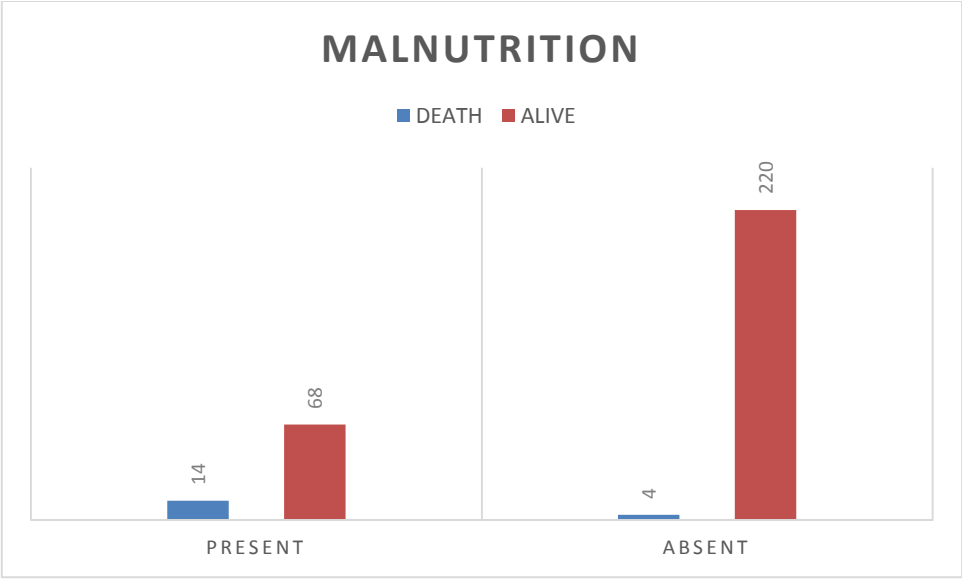

Diagram 27

NEED FOR MECHANICAL VENTILATION

VENTLATION REQ	NO OF PATIENTS	PERCENTAGE
YES	28	9%
NO	278	91%

Table 29

9% of admitted cases needed mechanical ventilation

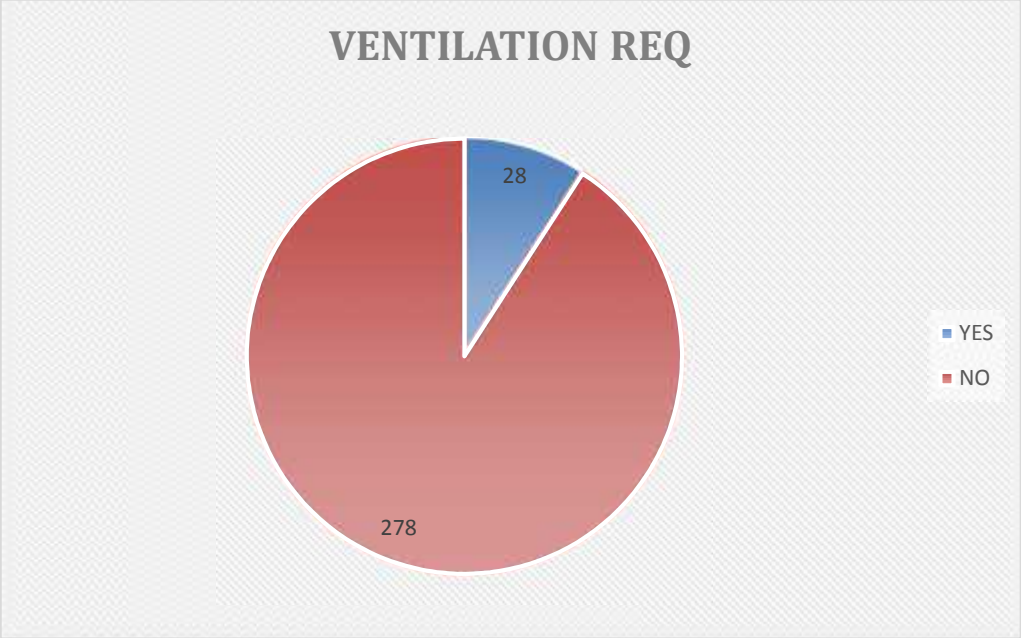

Diagram 28

VENTILATION REQ Vs DIAGNOSIS

	VENTILATION REQ	
DIAGNOSIS	**YES**	**NO**
BRONCHIOLITIS	3	44
CROUP	0	15
WALRI	0	43
PNEUMONIA	0	117
SEVERE PNEUMONIA	2	43
VERY SEVERE PNEUMONIA	23	16
P VALUE - 0.001		
SIGNIFICANT		
KRUSKAL WALLIS TEST		

Table 30

There is significant influence of ventilation requirement based on diagnosis with P value of 0.001 particularly very severe pneumonia.

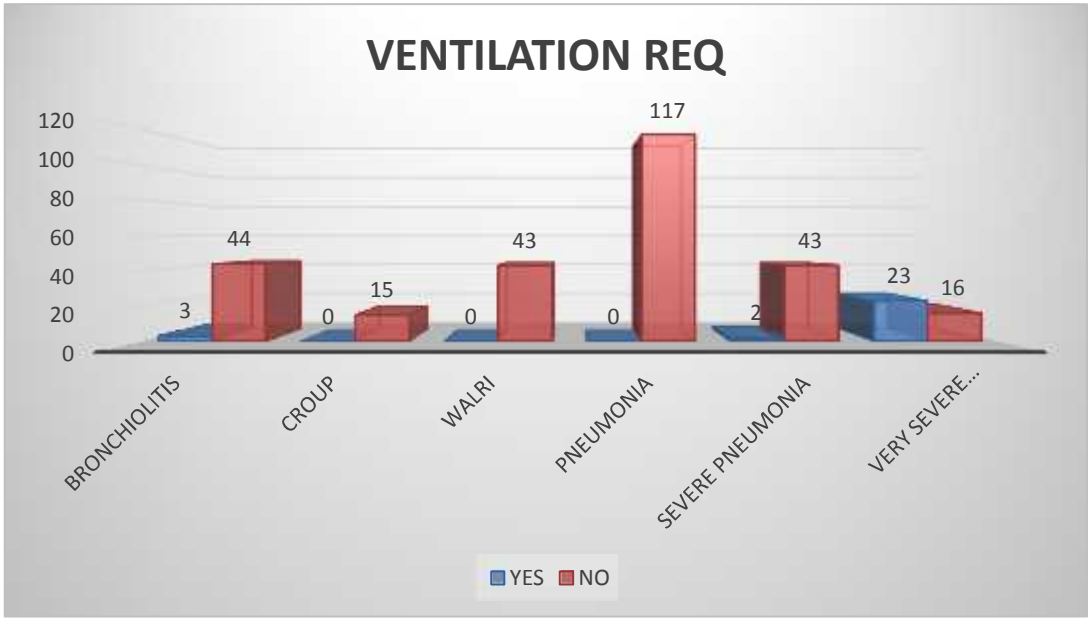

Diagram 28

VENTILATION REQ Vs DEATH

	VENTILATION REQ	
OUTCOME	**YES**	**NO**
DEATH	18	0
ALIVE	10	278
CHI SQUARE TEST		
P VALUE - 0.001		
ODDS RATIO - 28.8		
SIGNIFICANT		

Table 31

There is significant influence of requirement of ventilation over disease outcome with P value of 0.001.Patient who move in direction of mortality has 28 times higher chance of ventilator requirement.

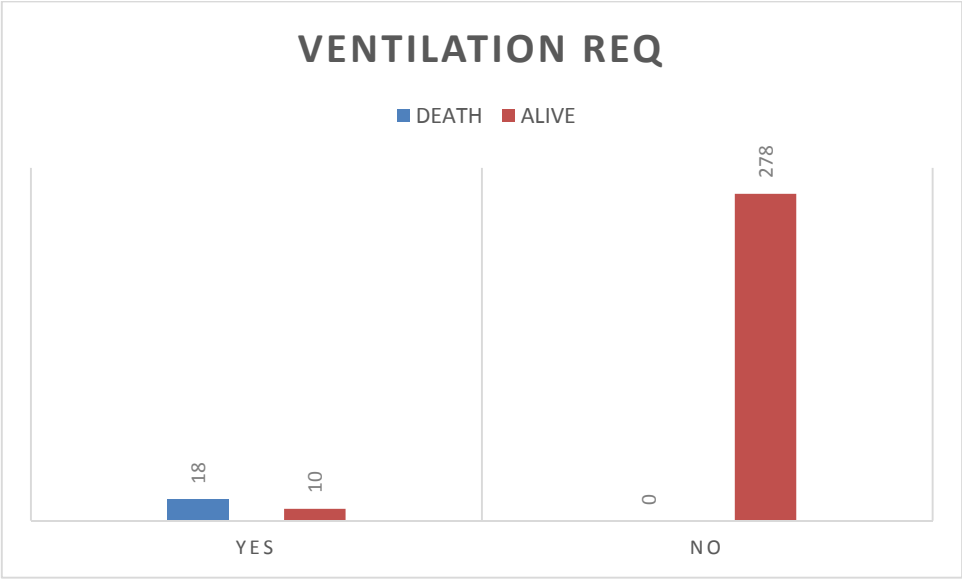

Diagram 29

PICU STAY

PICU STAY > 7 DAYS	NO OF PATIENTS	PERCENTAGE
YES	59	19%
NO	247	81%

Table 31

19% of the total admission cases needed PICU stay for more than 7 days

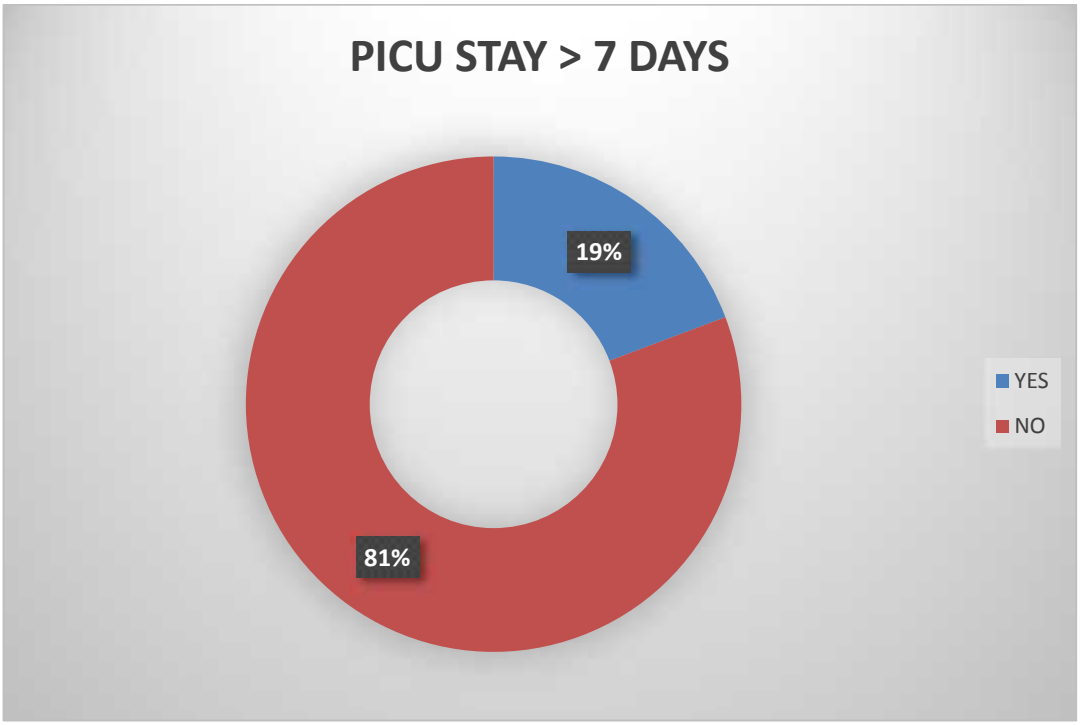

Diagram 30

PICU STAY Vs DIAGNOSIS

	PICU STAY > 7 DAYS	
DIAGNOSIS	**YES**	**NO**
BRONCHIOLITIS	3	44
CROUP	0	15
WALRI	0	43
PNEUMONIA	0	117
SEVERE PNEUMONIA	20	25
VERY SEVERE PNEUMONIA	36	3
P VALUE - 0.001		
SIGNIFICANT		
KRUSKAL WALLIS TEST		

Table 32

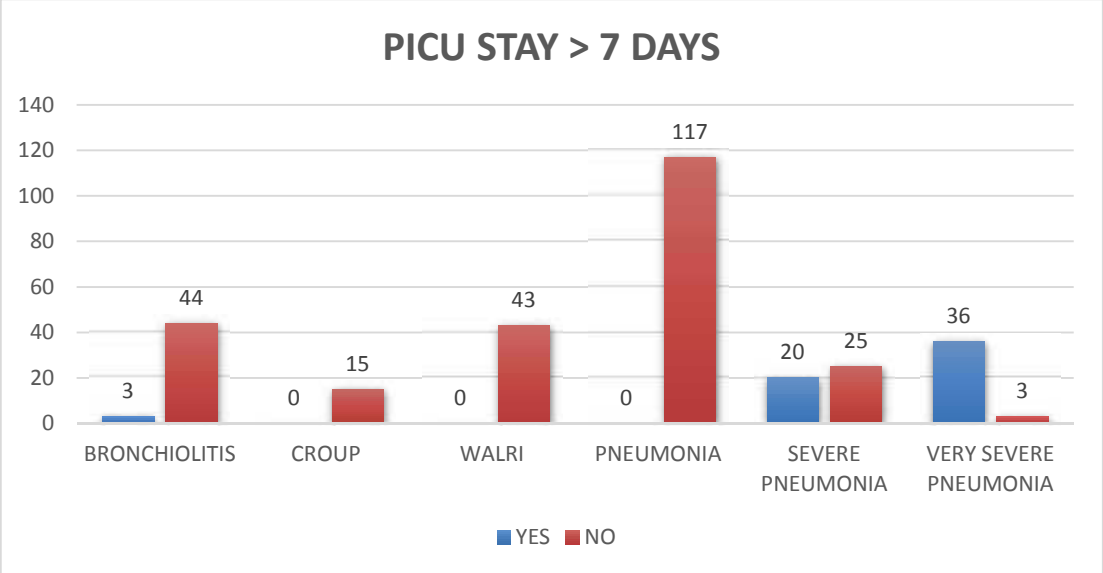

Diagram 31

There is significant influence need of PICU stay more than 7 days based on diagnosis with P value of 0.001 particularly severe and very severe pneumonia.

PICU STAY Vs DEATH

	PICU STAY > 7 DAYS	
OUTCOME	**YES**	**NO**
DEATH	14	4
ALIVE	45	243
CHI SQUARE TEST		
P VALUE - 0.001		
ODDS RATIO - 18.9		
SIGNIFICANT		

Table 33

There is significant influence of no of days of PICU stay over disease outcome with P value of 0.001.Patient whose disease outcome is death has more days of PICU stay.

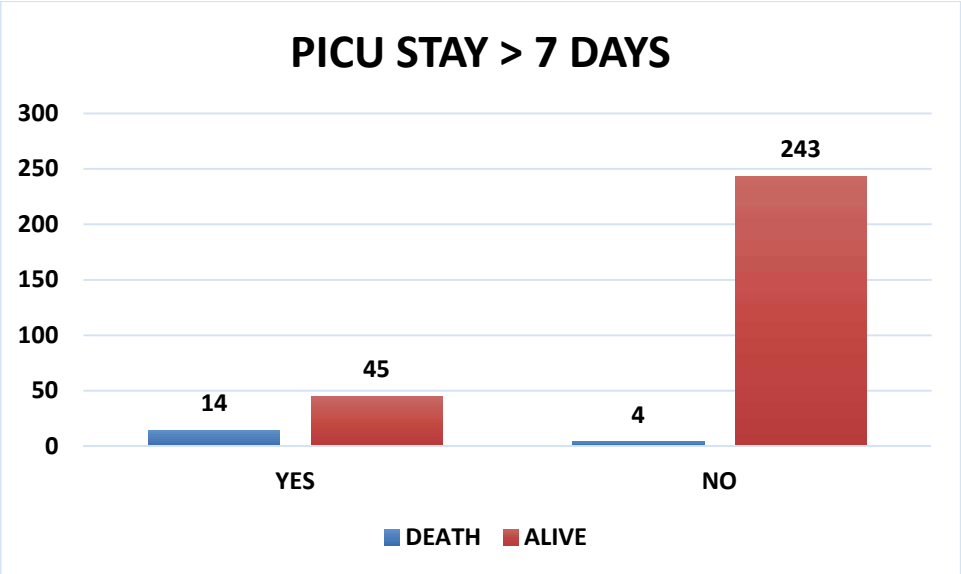

Diagram 32

HOSPITAL STAY

HOSPITAL STAY > 7 DAYS	NO OF PATIENTS	PERCENTAGE
YES	123	40%
NO	183	60%

Table 34

40% of the admitted cases needed hospital stay for more than 7 days

Diagram 33

HOSPITAL STAY Vs DIAGNOSIS

	HOSPITAL STAY > 7 DAYS	
DIAGNOSIS	**YES**	**NO**
BRONCHIOLITIS	8	39
CROUP	0	15
WALRI	10	33
PNEUMONIA	26	91
SEVERE PNEUMONIA	43	2
VERY SEVERE PNEUMONIA	36	3
P VALUE - 0.001		
SIGNIFICANT		
KRUSKAL WALLIS TEST		

Table 35

There is significant influence for need of hospital stay more than 7 days based on diagnosis with P value of 0.001 particularly severe and very severe pneumonia

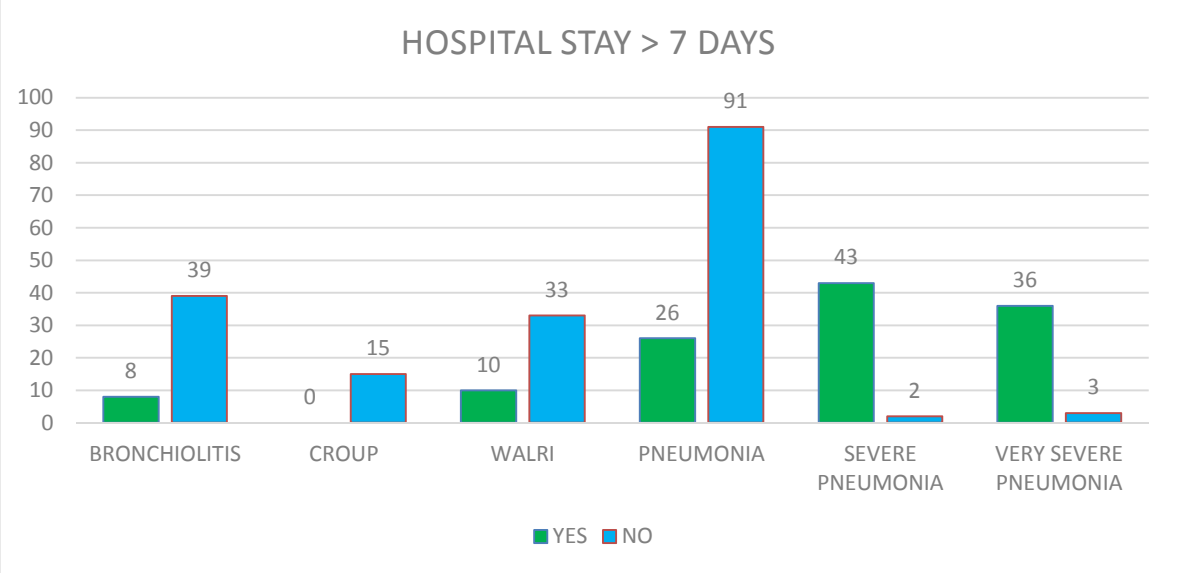

Diagram 34

HOSPITAL STAY vs DEATH

	HOSPITAL STAY > 7 DAYS	
OUTCOME	**YES**	**NO**
DEATH	14	4
ALIVE	109	179
CHI SQUARE TEST		
P VALUE – 0.001		
ODDS RATIO – 5.7		
SIGNIFICANT		

Table 36

There is significant influence of no of days of hospital stay over disease outcome with P value of 0.001.Patient whose disease outcome is death has more days of hospital stay.

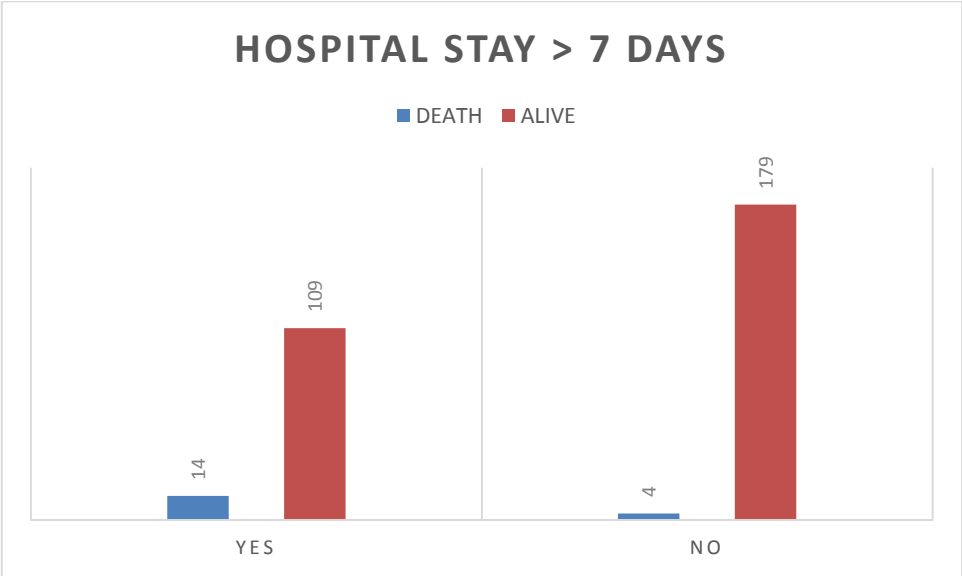

Diagram 35

DIAGNOSIS Vs PROGNOSIS

	PROGNOSIS	
DIAGNOSIS	**DEATH**	**ALIVE**
BRONCHIOLITIS	3	44
CROUP	0	15
WALRI	0	43
PNEUMONIA	0	117
SEVERE PNEUMONIA	0	45
VERY SEVERE PNEUMONIA	15	24
P VALUE – 0.001		
SIGNIFICANT		
KRUSKAL WALLIS TEST		

Table 37

There is significant influence on mortality based on diagnosis with P value of 0.001 particularly bronchiolitis and very severe pneumonia has more chance of ending up in death compared to other causes.

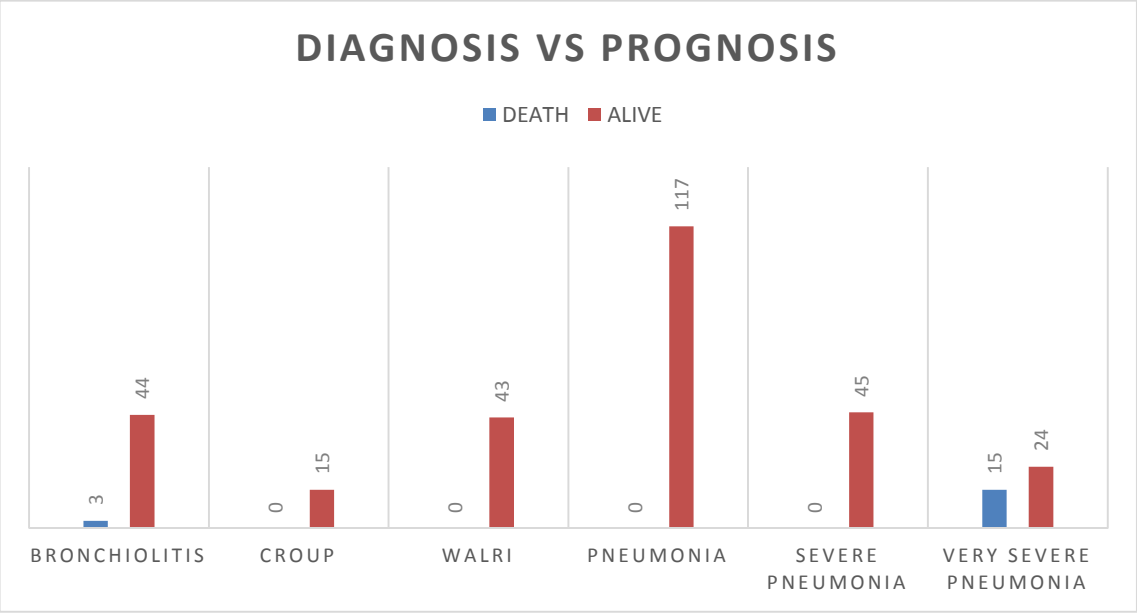

Diagram 36

7. DISCUSSION

ARI especially pneumonia is one of the leading cause of morbidity and mortality in developing countries like India. It contribute to almost 2 lakh under 5 death in our country. Pneumonia also accounts for 24% of national burden of disease in india.

Hence knowing the incidence , clinical profile of ARI in a tertiary care hospital reflects the burden in the community and identifying the risk factors for mortality and morbidity in the children aged 2 months to 60 months, will help in proper utilization of available resources and ensure adequate management of these children.

The aim of my study was to determine the respiratory disease pattern in children in age group of 2 months to 5 years and to analyse various factors influencing the morbidity and mortality of those cases.

The study was conducted in Tirunelveli government medical college during the period of 1/1/16 to 1/6/17. All the respiratory disease cases of age group between 2 months and 60 months were included except those children meeting the exclusion criteria.

Of the total of 2793 IP admissions in the paediatric department, 306 cases were diagnosed as ARI . The prevalence of respiratory infection during the time period in inpatients is almost 10.95%. It is almost similar to both males and females.

Among the admitted, infants constitute the largest proportion with 43.5 %.It is followed by children between 1 to 2 years of age which constitute 19% of total admissions. Among admitted, pneumonia is the most common diagnosis constituting 38.5%, followed by bronchiolitis which constitute 15.3%. severe pneumonia and very severe pneumonia constitute 14.7% and 12.5% respectively.

Both severe pneumonia and very severe pneumonia are more in infants. 60 % of total severe pneumonia cases are infants and 62% of very severe pneumonia are also from infants. As the age progresses its severity decreases, Various other studies have comparable results.(34,43,44,45,46).Ramachandran et al, Chhabra et al, Zaman k et al,HN bashour et al, SC Dharmage et al studies shows a similar pattern of decreasing ARI rate with increasing age.

Of the total 306 cases, 18 cases died, constituting 5.9%. It is about 0.64% of the total admissions in our department. Among them 15 cases were diagnosed to have very severe pneumonia and 3 cases were diagnosed to have bronchiolitis. Among the death significant proportion are infants.

Among the admitted cases,61% constitute males and 39% constitute female. Pneumonia cases were more diagnosed among males.67% of pneumonia cases are males. 53% of severe pneumonia cases are also

males. But mortality is more among females,10 out of 18 deaths were females.

Among the total admitted 57% of children had history of exclusive breast feeding .There is significant influence of presence or absence of exclusive breast feeding over diagnosis with P value of .002 .Particularly severe and very sever e pneumonia is more common in group which is not exclusively breast fed. Also there is significant influence over the outcome with P value .041 with more babies died in the group which is not exclusively breast fed.(35,36) Laura m Lamberti et al ,Mihrshahi S et al shows significant mortality following pneumonia in babies not exclusively breast fed

Among the admitted cases, 80% are from socioeconomic status 4/5.There is significant influence of presence of socioeconomic status 4 and 5 over diagnosis with P value of .003. Particularly severe and very severe pneumonia are more in those categories. There is also significant influence of presence or absence of socio economic status over the outcome with P value of .026. There are numerous studies with comparable results(37,38,39,40,41,42). Numerous studies like Farzana Islam et al , Nilanjan MK et al, Savitha MR et al., Biswas A et al., Tupasi Thelma E et al., and Gregory Gardner et al., studies shows significant association between socioeconomic factors and pneumonia incidence and outcome. Poor socioeconomic factor can be

taken as a proxy factor for poor housing condition, overcrowding, ventilation, type of cooking fuel etc.

In our study, 74% children were fully immunised. And 26% were not fully immunised. There is significant influence of immunisation over diagnosis with P value of .001. There is no significant influence of immunisation over the outcome of disease with P value of 0.896(47, 48, and 39). Various studies by Prajapati et al, Deb, and Savitha et al , reported similar findings with incidence of pneumonia is more in unimmunized population.

In our study, 43% of children had history of bad child rearing practises. There is significant influence of bad child rearing practise over diagnosis with P value of 0.001.Among the children with severe pneumonia, 62% had history of bad child rearing practices. And 54% of children with very severe pneumonia had history of bad child rearing practices. But study showed no significant influence of bad child rearing practice over outcome of disease particularly death with P value of 0.0402.

In our study, a total of 43 children were positive for sepsis screening. It constitutes about 14%. There is significant influence of presence of sepsis over diagnosis with P value of .001 particularly Very severe pneumonia. Also there is significant influence of presence or absence of sepsis over disease outcome with P value of .001 and odds ratio

of 11.52 which shows patients with sepsis has almost 12 times more chance of mortality.

In our study a total of 27% children had malnutrition with WHO for weight for age less than -2 Z score. And there is significant influence of presence or absence of malnutrition over diagnosis with P value of .001 particularly severe and very severe pneumonia is more in patients with under nutrition. Also, among 18 deaths, 14 had malnutrition. There is significant influence of presence or absence of malnutrition over disease outcome with P value of 0.001. Also patients with malnutrition had 11 times more chance of mortality. There are numerous studies with comparable results like (38,39,40,41) Mitra NK, Savitha M.R et al, Biswas A et al, and Tupasi Thelma E et al showing significant relationship between morbidity and mortality of pneumonia with under nutrition.

In our study, among 306 admitted cases, 28 required invasive mechanical ventilation. It constitutes 9 % of the total admission. There is significant influence of ventilation requirement based on diagnosis with P value 0.001 particularly very severe pneumonia. Also significant influence on outcome, with patients who move in direction of mortality has 28 times higher chance of ventilator requirement.

In our study, total of 59 patients had PICU stay more than 7 days. It constitute 19% of total admissions. There is significant influence need of PICU stay more than 7 days based on diagnosis with P value of .001

particularly severe and very severe pneumonia. Among total admissions 40 % of children had hospital stay more than 7 days. There is significant influence of need of hospital stay more than 7 days based on diagnosis with P value of 0.001 particularly sever and very severe pneumonia.

In our study, there is significant influence of mortality based on diagnosis with P value of 0.001 particularly very severe pneumonia and bronchiolitis has more chance of ending up in death compared to other causes

The main strength of the study was that it is done over a period of one and a half years and thereby excluding the seasonal variations and is done as a observational prospective study. The recommendations of the study are that the primary care paediatrician should identify ARI cases with risk factors for developing severe and very severe pneumonia and also children with risk factors for high mortality to be referred to a tertiary care centre as early as possible. At the tertiary level one should anticipate complications in those children having the risk factors and treat them aggressively to reduce morbidity and mortality.

8.LIMITATIONS

Being a hospital based study the applicability of the results to the community can differ.

9.CONCLUSION

1. The incidence of ARI cases among hospital admission is 10.95%.

2. Infants constitute 43.5% of the total admissions with severe and very severe pneumonia are more in this age group with P value 0.001.

3. Pneumonia is the most common diagnosis with 38.5% cases followed by bronchiolitis with 15.30%.

4. Case fatality rate for the ARI cases was 5.90% with more number of death occurred in infants.

5. There is significant influence of exclusive breast feeding , socio economic status , immunization status, malnutrition, bad child rearing practices over the morbidity and mortality of ARI cases.

6. Evidence of sepsis has a significant influence over disease outcome (death) with ODDS RATIO 11.52 .

7. There is significant influence of presence or absence of malnutrition over disease outcome with P value 0.001 .Patient with malnutrition has 11 times more chance of mortality.

8. There is significant influence of requirement of ventilation over disease outcome with P value of 0.001.Patient who move in direction of mortality had 28 times higher chance of ventilator requirement.

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11. ANNEXURES
A. PROFORMA

1. NAME

2. AGE

   (a) 60 days- 6 m (b) 7 - <12 m (c) 1Y - 3Y (d) 4 - 5Y

3. IP NO

4. SEX (a) male (b) female

   RISK FACTORS:

5. Birth weight (a) <1 kg (b) 1-1.5 kg (c) 1.5 – 2.5 kg (d) >2.5 kg

6. Order of birth (a) first (b) second (c) third or more

7. Neonatal h/o of MAS (a) yes (b) no

8. Neonatal h/o of RDS (a) yes (b) no

9. Neonatal h/o of sepsis (a) yes (b) no

10. Breast feeding

    (a) < 6 months (b) > 6months

11. Bottle feeding (a) yes (b) no

12. h/o nose blowing /ear blowing (a) yes (b) no

13. Immunization status -

    (a) Yes, immunized (b)Partial (c) Not immunized

14.Socioeconomic status

(a) Class 1 (b) class 2 (c) class 3 (d) class 4

15.Overcrowding / large family size (a) yes (b) no

16.Cooking Fuel Other than LPG (a) yes (b) no

17.Family h/o bronchitis /Asthma (a) yes (b) no

18. H/o Passive smoking (a) yes (b) no

19.H/o pets in the family (a) yes (b) no

17.Working status of father (a) yes (b) no

18. Education Status of mother (a) <10th (b) >10th

19.Age at Marriage (a) < 20 (b) >20

18.Contact h/o TB (a) yes (b) no

19.Preceding h/o of URTI (a) yes (b) no

20.Preceding h/o of Otitis Media (a) yes (b) no

22. h/o of measles within last 3 months (a) yes (b) no

23.Duration of antibiotic therapy prior to admission

Oral : (a) <3 days (b) 3- <5 days (c) 5d -1week (d) >1 week

Parenteral : a) <3 days (b) 3- <5 days (c) 5d -1week (d) >1 week

<u>CLINICAL FEATURES</u>

24.FEVER (T-˚F) (a) N- <100 (b) 100-<102 (c)>102

25. Heart Rate (/min)

25.RR(/min) (a) <40 (b)40-<50 (c)50-<60 (d)60-<70 (e)>70

26.Chest in-drawing : SCR (a) yes (b) no

27. Inter costal retractions ICR (a) yes (b) no

28.Stridor (a) yes (b) no

28.Grunting (a)yes (b)no

29.Alae nasi flaring (a)yes (b)no

30.Wheeze (a) yes (b)no

31. Crepitations (a)yes (b)no

32.Cyanosis (a)yes (b)no

33.Spo2 in room air (a) <80% (b)80-84 % (c)85-92% (d) >92%

34.Dehydration (a)yes (b)no

35.Shock (a)yes (b)no

36.Sepsis (a)yes (b)no

37.ALOC (a) A (b) V (c)P (d)U

38.Lethargy /irritability (a)yes (b)no

39.Refusal of feeds (a)yes (b)no

40.Convulsions (a)yes (b)no

41.Meningismus (a)yes (b)no

42.Abdominal pain (a)yes (b)no

ASSOCIATED CO – MORBID SYMPTOMS

44. CHD (a) yes (b)no

45.Muscle disorders (a) yes (b)no

46.Vitamin a deficiency (a) yes (b)no

47.Anemia (a) yes (b)no

48.Malnutrition (a) yes (b)no

49.Weight for age Z score

(a)<-3 (b)-3 to -2 (c) <-2 to -1 (d)-1 to 0 (e) 0-1 (f) 1-2 (g)2-3

50.Duration of PICU Stay

(a) <48 hrs (b) < 7days (c) > 7days

51.Duration of hospital stay

(a) <7 days (b) > 7 days

INVESTIGATIONS

52.TC (a) <5000 (b)5000-15000 (c)>15000

53. DC-increase in (a) polymorphs (b)lymphocytes

54.CXR- (a) normal (b) Bronchopneumonia (c) Consolidation (d)Hyperinflation

55.CRP (a)positive (b)negative

56. BLOOD C/S (a)positive (b)negative

57.Organisms

(a) Staphylococcus (b) pneumococcus (c) pseudomonas (d)others

58. Mantoux (a)positive (b)negative

59. ICTC (a)positive (b)negative

60.OTHER INVESTIGATIONS

61. FINAL DIAGNOSIS

1.Pneumonia

(a). Pneumonia (b) Severe Pneumonia
(c) Very severe Pneumonia

2. Bronchiolitis

3. Croup

4. WALRI

5. others

61. Need For Mechanical Ventilation (a) yes (b) no

62. Outcome

(a)Recovery (b) Death (c) Complications

63.Complications

(a) Sepsis (b)empyema (c)lung abscess (d)pleural fibrosis

64.Death in

(a) <24 hours (b)24-<48hrs (c)48-<72hrs (d)3-7d (e)>1week

PNEUMONIA	MALE	FEMALE
AGE		
2-6 MONTHS	34	19
6M-1 YEAR	37	16
1YR-5YR	55	40

SEASONAL VARIATION	TOTAL CASI	201
SUMMER(APRIL-JUNE)		19
WINTER(OCTOBER-JANUARY)		79
TOTAL ADMISSIONS		2793
MALE		1678
FEMALE		1115
TOTAL ARI CASES ADMITTED		307
MALE		184
FEMALE		123
TOTAL PNEUMONIA CASES ADMITTE		201
MALE		126
FEMALE		75
WALRI TOTAL ADMISIONS		29
MALE		15
FEMALE		14
ASTHMA TOTAL ADMISSIONS		6
MALE		2
FEMALE		4
BRONCHIOLITIS TOTAL ADMISSIONS		7
MALE		4
FEMALE		3
CROUP TOTAL ADMISSIONS		2
MALE	NIL	
FEMALE		2

Sl No	Age	Sex	EBF 6M	SES 4 and 5	IMMUNIZATN	BCRP	SEPSIS	MALNUTRN	VENTILN	PICU 7 D	HOSPITL 7D	DIAGNOSIS	OUTCOME
1	6	M	N	Y	N	Y	Y	Y		Y	Y	VSP	
2	4	M	N	Y	N	Y	N	N		N	Y	SP	
3	5	M	Y	Y	N	Y	N	N		N	Y	SP	
4	3	F	N	N	Y	Y	N	N		N	N	P	
5	6	M	N	Y	Y	Y	Y	Y	YES	Y	Y	VSP	
6	5	F	N	N	Y	N	N	N		N	N	P	
7	5	M	Y	N	Y	Y	N	N		N	N	P	
8	3	M	Y	Y	N	Y	N	N		N	N	P	
9	6	M	N	Y	Y	Y	Y	Y		Y	Y	VSP	
10	2	F	Y	Y	Y	N	N	N		N	N	P	
11	2	F	Y	N	N	Y	N	N		N	Y	SP	
12	3	M	N	Y	N	Y	Y	Y	YES	Y	Y	VSP	DEATH
13	4	M	N	Y	Y	Y	N	N		N	N	P	
14	4	M	Y	Y	Y	N	N	N		N	N	P	
15	6	M	N	Y	Y	Y	N	Y		N	Y	SP	
16	2	F	Y	Y	Y	N	N	N		N	N	P	
17	4	M	Y	N	Y	N	N	N		N	N	P	
18	3	F	N	Y	Y	Y	Y	Y		Y	Y	VSP	
19	6	M	Y	N	Y	N	N	N		N	N	P	
20	4	M	Y	Y	Y	Y	N	N		N	N	P	
21	5	F	N	Y	Y	Y	N	Y	YES	Y	Y	SP	
22	6	M	N	Y	Y	Y	N	Y		Y	Y	SP	

Sl No	Age	Sex	EBF 6M	SES 4 and 5	IMMUNIZATN	BCRP	SEPSIS	MALNUTRN	VENTILN	PICU 7 D	HOSPITL 7D	DIAGNOSIS	OUTCOME
23	3	M	Y	Y	Y	N	N	N		N	N	P	
24	4	F	N	Y	Y	Y	N	Y		Y	Y	SP	
25	2	M	Y	N	Y	N	N	N		N	N	P	
26	6	M	Y	Y	Y	Y	N	N		N	Y	P	
27	3	M	Y	Y	Y	Y	N	N		N	N	P	
28	4	F	Y	Y	Y	Y	N	Y		Y	Y	SP	
29	4	F	N	Y	N	Y	Y	Y	YES	Y	Y	VSP	DEATH
30	5	M	Y	Y	N	Y	N	N		N	Y	SP	
31	6	M	N	Y	Y	N	N	N		N	N	P	
32	5	M	Y	Y	Y	Y	N	N		N	N	P	
33	2	F	Y	N	Y	N	N	N		N	N	P	
34	3	M	Y	Y	Y	Y	N	N		N	N	P	
35	5	F	N	Y	N	Y	N	N		N	Y	SP	
36	6	M	Y	Y	Y	N	N	N		N	N	P	
37	5	M	Y	Y	Y	Y	N	N		N	N	P	
38	4	M	Y	Y	Y	Y	N	N		N	N	P	
39	5	F	N	Y	Y	Y	N	N		N	Y	SP	
40	3	F	N	Y	Y	Y	Y	Y	YES	N	N	VSP	DEATH
41	6	M	N	Y	Y	N	N	N		N	N	P	
42	6	M	N	Y	N	Y	Y	Y		Y	Y	VSP	
43	5	M	N	Y	Y	Y	N	N		N	Y	P	
44	6	F	N	Y	N	Y	Y	Y		Y	Y	VSP	

Sl No	Age	Sex	EBF 6M	SES 4 and 5	IMMUNIZATN	BCRP	SEPSIS	MALNUTRN	VENTILN	PICU 7 D	HOSPITL 7D	DIAGNOSIS	OUTCOME
45	4	F	Y	N	Y	N	N	N		N	N	P	
46	5	M	Y	N	Y	Y	N	N		N	N	P	
47	2	M	Y	Y	Y	N	N	N		N	N	P	
48	4	M	Y	Y	Y	Y	N	N		N	N	P	
49	6	F	Y	Y	Y	Y	Y	Y		Y	Y	VSP	
50	5	M	N	Y	Y	Y	Y	Y	YES	Y	Y	VSP	DEATH
51	3	M	Y	N	Y	N	N	Y		Y	Y	SP	
52	4	F	Y	Y	Y	N	N	N		N	N	P	
53	6	F	Y	Y	N	N	N	N		N	Y	P	
54	10	M	Y	Y	Y	Y	N	N		N	Y	SP	
55	12	M	Y	Y	Y	N	N	N		N	N	P	
56	8	M	N	Y	Y	Y	N	Y		Y	Y	VSP	
57	7	F	N	Y	Y	Y	Y	Y	YES	Y	Y	VSP	
58	11	M	Y	N	Y	N	N	N		N	N	P	
59	12	F	N	Y	N	Y	N	Y		Y	Y	SP	
60	10	M	Y	Y	Y	Y	N	N		N	Y	SP	
61	10	M	Y	N	Y	N	N	N		N	N	P	
62	8	F	N	Y	Y	N	N	N		N	Y	P	
63	9	F	Y	N	Y	N	N	N		N	N	P	
64	11	M	N	Y	Y	Y	N	N		N	Y	SP	
65	12	M	Y	Y	N	Y	N	Y		Y	Y	SP	
66	8	M	N	Y	Y	Y	N	N		N	Y	P	

Sl No	Age	Sex	EBF 6M	SES 4 and 5	IMMUNIZATN	BCRP	SEPSIS	MALNUTRN	VENTILN	PICU 7 D	HOSPITL 7D	DIAGNOSIS	OUTCOME
67	10	F	N	Y	N	N	N	N		N	N	P	
68	7	M	N	Y	Y	Y	Y	Y	YES	Y	Y	VSP	DEATH
69	10	M	N	Y	Y	Y	N	N		N	Y	SP	
70	12	F	Y	Y	Y	N	N	N		N	N	P	
71	12	M	Y	Y	Y	Y	Y	Y		Y	Y	VSP	
72	8	M	Y	Y	Y	N	N	N		N	Y	P	
73	11	M	Y	Y	Y	N	N	N		N	N	P	
74	12	M	Y	Y	Y	Y	N	Y		Y	Y	SP	
75	7	M	N	Y	Y	Y	N	N		N	N	P	
76	10	F	N	Y	Y	Y	N	Y	YES	Y	Y	SP	
77	8	M	Y	N	Y	N	N	N		N	N	P	
78	11	M	N	Y	Y	Y	Y	N		Y	Y	VSP	
79	9	F	Y	Y	Y	N	Y	Y		N	N	P	
80	9	M	Y	Y	Y	N	N	Y		N	Y	SP	
81	10	M	Y	Y	Y	N	Y	Y	YES	N	N	VSP	DEATH
82	7	M	Y	Y	N	N	N	N		N	Y	P	
83	8	F	N	Y	Y	Y	N	N		N	N	P	
84	9	M	N	Y	Y	Y	N	N		N	Y	SP	
85	11	M	Y	N	Y	N	N	N		N	N	P	
86	12	F	N	Y	Y	N	Y	Y		Y	Y	VSP	
87	12	M	Y	N	Y	Y	N	N		N	N	P	
88	10	M	N	Y	N	Y	N	Y		N	Y	SP	

Sl No	Age	Sex	EBF 6M	SES 4 and 5	IMMUNIZATN	BCRP	SEPSIS	MALNUTRN	VENTILN	PICU 7 D	HOSPITL 7D	DIAGNOSIS	OUTCOME
89	8	M	Y	Y	Y	N	N	N		N	N	P	
90	7	F	Y	Y	Y	Y	N	Y	YES	Y	Y	VSP	
91	9	F	Y	Y	Y	N	N	N		N	N	P	
92	11	F	N	Y	Y	N	Y	N	YES	Y	Y	VSP	DEATH
93	12	M	Y	Y	Y	Y	Y	Y		Y	Y	VSP	
94	8	M	N	Y	Y	Y	N	N		N	Y	SP	
95	9	M	N	Y	N	N	N	N		N	N	P	
96	7	M	Y	Y	Y	N	Y	Y		Y	Y	VSP	
97	10	F	N	Y	Y	N	N	N		N	N	P	
98	12	M	N	N	Y	N	N	N		N	N	P	
99	11	M	N	Y	Y	N	Y	Y	YES	Y	Y	VSP	
100	7	M	Y	Y	Y	N	N	N		N	N	P	
101	10	M	Y	Y	Y	N	Y	Y		Y	Y	SP	
102	7	F	N	Y	Y	Y	Y	Y		Y	Y	SP	
103	10	F	N	Y	Y	Y	N	Y		Y	Y	SP	
104	12	M	Y	N	Y	N	N	N		N	N	P	
105	12	M	Y	Y	Y	N	N	N		N	N	P	
106	7	M	N	Y	Y	N	N	Y	YES	Y	Y	VSP	
107	20	M	Y	Y	Y	N	N	N		N	Y	P	
108	24	M	N	Y	Y	N	N	Y		N	Y	SP	
109	15	M	N	Y	Y	Y	Y	N	YES	N	N	VSP	DEATH
110	18	M	N	Y	Y	Y	N	N		N	N	P	

Sl No	Age	Sex	EBF 6M	SES 4 and 5	IMMUNIZATN	BCRP	SEPSIS	MALNUTRN	VENTILN	PICU 7 D	HOSPITL 7D	DIAGNOSIS	OUTCOME
111	21	F	Y	Y	Y	N	N	N		N	N	P	
112	17	F	Y	Y	Y	N	N	Y		Y	Y	SP	
113	22	M	Y	N	Y	N	N	N		N	N	P	
114	16	F	Y	Y	Y	N	N	N		N	N	P	
115	18	M	Y	Y	Y	N	N	N		N	N	P	
116	13	M	N	Y	N	N	N	Y		Y	Y	SP	
117	15	F	N	Y	N	N	Y	Y	YES	Y	Y	VSP	DEATH
118	17	M	Y	Y	Y	N	N	N		N	N	P	
119	21	M	N	N	Y	N	N	N		N	N	P	
120	17	F	Y	Y	Y	Y	N	N		N	Y	P	
121	14	M	Y	Y	N	N	N	Y		N	Y	P	
122	15	M	Y	N	Y	N	N	N		N	N	P	
123	16	F	Y	Y	N	N	Y	Y	YES	Y	Y	VSP	DEATH
124	13	F	Y	Y	Y	Y	Y	N		Y	Y	VSP	
125	20	M	Y	Y	Y	N	N	N		N	N	P	
126	16	M	N	Y	Y	Y	N	N		N	N	P	
127	15	F	N	Y	Y	N	N	N		N	N	P	
128	20	M	N	Y	Y	N	N	Y		N	Y	SP	
129	21	M	Y	Y	Y	N	N	N		N	N	P	
130	19	M	Y	Y	Y	N	N	N		Y	Y	VSP	
131	14	M	Y	Y	Y	N	Y	Y	YES	Y	Y	VSP	
132	22	F	Y	Y	Y	N	N	N		N	Y	P	

Sl No	Age	Sex	EBF 6M	SES 4 and 5	IMMUNIZATN	BCRP	SEPSIS	MALNUTRN	VENTILN	PICU 7 D	HOSPITL 7D	DIAGNOSIS	OUTCOME
133	17	M	Y	Y	Y	N	N	N		N	N	P	
134	14	F	N	Y	Y	N	N	Y		N	Y	SP	
135	16	M	N	Y	Y	N	N	N		N	N	P	
136	25	M	Y	Y	Y	N	N	N		N	N	P	
137	28	M	Y	N	Y	N	N	N		N	N	P	
138	36	F	N	Y	Y	N	Y	N	YES	Y	Y	VSP	DEATH
139	30	M	Y	Y	Y	N	N	N		N	Y	P	
140	26	M	N	Y	Y	N	N	N		N	Y	P	
141	34	M	N	N	N	N	N	N		N	N	P	
142	28	M	Y	N	Y	N	N	N		N	N	P	
143	30	F	N	N	Y	N	N	N		N	N	P	
144	36	F	N	Y	N	N	N	Y		Y	Y	SP	
145	32	M	Y	Y	Y	N	N	N		N	Y	P	
146	31	F	Y	Y	Y	N	Y	N	YES	Y	Y	VSP	DEATH
147	26	M	N	Y	N	Y	N	N		N	Y	P	
148	35	F	Y	Y	Y	Y	N	N		N	N	P	
149	34	M	N	N	Y	N	N	N		N	N	P	
150	27	M	Y	Y	N	Y	Y	N		Y	Y	VSP	
151	36	F	Y	Y	N	N	N	N		N	Y	P	
152	40	M	N	Y	Y	N	N	N		N	Y	P	
153	48	F	Y	Y	N	Y	N	Y		N	Y	SP	
154	44	M	Y	Y	Y	Y	N	N		N	N	P	

Sl No	Age	Sex	EBF 6M	SES 4 and 5	IMMUNIZATN	BCRP	SEPSIS	MALNUTRN	VENTILN	PICU 7 D	HOSPITL 7D	DIAGNOSIS	OUTCOME
155	50	F	N	N	Y	N	N	N		N	N	P	
156	58	M	Y	Y	Y	N	N	N		N	N	P	
157	54	F	N	N	N	N	N	N		N	Y	SP	
158	56	M	Y	Y	N	N	N	N		N	Y	P	
159	60	M	Y	Y	Y	N	N	N		N	N	P	
160	40	F	Y	Y	N	N	Y	N	YES	Y	Y	VSP	
161	46	M	Y	Y	Y	N	N	Y		N	Y	SP	
162	52	F	Y	Y	Y	N	N	N		N	N	P	
163	56	M	N	Y	Y	Y	N	N		N	Y	P	
164	54	F	N	Y	Y	N	N	N		N	N	P	
165	41	M	Y	N	Y	N	N	N		N	Y	P	
166	45	F	N	N	Y	N	N	Y		Y	Y	SP	
167	60	M	N	Y	Y	Y	N	N		N	N	P	
168	58	F	N	Y	Y	Y	N	N		N	N	P	
169	50	M	Y	Y	Y	N	Y	Y	YES	Y	Y	VSP	DEATH
170	44	F	Y	N	Y	N	N	N		N	N	P	
171	46	M	N	N	Y	N	N	N		N	N	P	
172	40	F	Y	N	Y	N	N	N		N	Y	P	
173	42	M	N	Y	Y	N	Y	N		Y	Y	VSP	
174	50	M	Y	N	Y	N	N	N		N	N	P	
175	54	F	N	N	Y	Y	N	N		N	N	P	
176	58	M	N	Y	N	N	N	N		N	Y	P	

Sl No	Age	Sex	EBF 6M	SES 4 and 5	IMMUNIZATN	BCRP	SEPSIS	MALNUTRN	VENTILN	PICU 7 D	HOSPITL 7D	DIAGNOSIS	OUTCOME
177	37	F	Y	Y	Y	Y	N	N		Y	Y	SP	
178	42	M	N	Y	Y	N	Y	Y	YES	Y	Y	VSP	DEATH
179	50	F	Y	Y	Y	N	N	N		N	N	P	
180	56	M	Y	N	N	Y	N	N		N	N	P	
181	60	F	Y	Y	Y	N	N	N		N	N	P	
182	40	M	N	Y	Y	N	N	N		N	N	P	
183	46	F	Y	Y	Y	N	N	N		Y	Y	SP	
184	52	M	N	N	Y	N	N	N		Y	Y	SP	
185	58	F	Y	Y	Y	N	N	Y		N	Y	P	
186	40	M	Y	Y	N	N	N	N		N	N	P	
187	41	F	N	Y	N	N	N	N		N	N	SP	
188	43	M	N	Y	Y	N	N	N		N	Y	P	
189	40	M	Y	Y	Y	N	N	N		N	N	P	
190	56	F	N	N	Y	Y	N	N		N	N	P	
191	44	M	Y	Y	Y	N	Y	Y	YES	Y	Y	VSP	
192	37	F	Y	N	Y	N	N	N		N	Y	SP	
193	43	F	N	Y	N	Y	Y	N		Y	Y	SP	
194	50	M	Y	Y	Y	Y	N	N		N	Y	P	
195	40	M	N	Y	Y	N	N	N		N	N	P	
196	53	F	N	Y	Y	N	Y	Y	YES	Y	Y	VSP	DEATH
197	60	M	Y	N	Y	Y	N	N		N	N	SP	
198	52	F	Y	Y	Y	N	N	N		N	N	P	

Sl No	Age	Sex	EBF 6M	SES 4 and 5	IMMUNIZATN	BCRP	SEPSIS	MALNUTRN	VENTILN	PICU 7 D	HOSPITL 7D	DIAGNOSIS	OUTCOME
199	40	M	N	Y	Y	N	N	Y		N	Y	SP	
200	50	F	Y	Y	Y	N	N	N		N	N	P	
201	56	F	N	Y	Y	N	N	N		N	Y	P	
202	6	M	N	Y	Y	N	N	N		N	N	B	
203	10	M	Y	Y	N	N	N	Y		N	Y	B	
204	8	F	Y	Y	Y	N	N	N		N	N	B	
205	14	M	N	Y	Y	N	N	N		N	N	B	
206	18	F	N	N	Y	N	N	N		N	N	B	
207	8	M	Y	Y	Y	Y	N	Y		N	Y	B	
208	6	F	Y	Y	N	Y	Y	N		Y	Y	B	
209	15	M	N	Y	N	Y	N	N		N	N	B	
210	6	F	Y	Y	Y	N	N	N		N	N	B	
211	8	M	N	Y	N	Y	N	Y		N	N	B	
212	12	F	N	Y	N	Y	N	N		N	N	B	
213	16	M	Y	Y	N	N	Y	Y	YES	Y	Y	B	DEATH
214	18	F	Y	Y	N	N	N	N		N	N	B	
215	22	M	N	Y	Y	N	N	N		N	N	B	
216	14	F	Y	N	Y	N	N	N		N	N	B	
217	8	M	N	Y	Y	N	N	N		N	N	B	
218	13	M	Y	Y	Y	N	N	Y		N	N	B	
219	10	M	Y	Y	N	N	N	N		N	N	B	
220	6	F	N	Y	Y	N	N	N		N	N	B	

Sl No	Age	Sex	EBF 6M	SES 4 and 5	IMMUNIZATN	BCRP	SEPSIS	MALNUTRN	VENTILN	PICU 7 D	HOSPITL 7D	DIAGNOSIS	OUTCOME
221	8	M	Y	Y	N	Y	N	N		N	N	B	
222	14	M	N	Y	Y	N	N	N		N	N	B	
223	6	F	N	Y	N	Y	N	Y		N	N	B	
224	10	M	Y	Y	Y	N	N	N		N	N	B	
225	12	F	N	N	Y	Y	N	N		N	N	B	
226	16	M	Y	Y	Y	N	N	N		N	N	B	
227	20	M	N	Y	N	N	N	N		N	N	B	
228	15	F	N	Y	Y	N	Y	Y	YES	N	N	B	DEATH
229	6	M	Y	Y	Y	N	N	N		N	N	B	
230	9	F	Y	N	Y	N	N	N		N	N	B	
231	14	F	Y	Y	Y	Y	N	N		N	N	B	
232	10	M	Y	N	Y	Y	N	N		N	N	B	
233	6	M	N	Y	Y	N	N	Y		N	N	B	
234	8	F	Y	Y	Y	N	N	N		N	N	B	
235	15	M	N	Y	N	Y	N	N		N	Y	B	
236	12	F	Y	Y	Y	N	N	Y		N	N	B	
237	18	F	N	Y	Y	Y	N	N		N	N	B	
238	14	M	N	Y	Y	N	N	N		N	Y	B	
239	8	F	Y	Y	Y	N	N	N		N	N	B	
240	10	M	N	N	Y	Y	N	N		N	N	B	
241	12	M	N	Y	Y	Y	N	N		N	N	B	
242	15	F	Y	Y	Y	Y	N	N		N	N	B	

Sl No	Age	Sex	EBF 6M	SES 4 and 5	IMMUNIZATN	BCRP	SEPSIS	MALNUTRN	VENTILN	PICU 7 D	HOSPITL 7D	DIAGNOSIS	OUTCOME
243	20	M	N	Y	N	Y	N	N		N	N	B	
244	10	F	Y	Y	N	Y	N	Y		N	Y	B	
245	15	M	Y	Y	Y	Y	N	N		N	N	B	
246	14	F	Y	Y	Y	N	Y	Y	YES	Y	Y	B	DEATH
247	6	M	N	Y	N	Y	N	N		N	N	B	
248	16	M	Y	N	Y	Y	N	Y		N	N	B	
249	46	M	Y	Y	N	N	N	N		N	Y	W	
250	20	F	Y	N	Y	N	N	N		N	N	W	
251	24	M	N	Y	Y	Y	N	Y		N	Y	W	
252	36	M	Y	Y	N	N	N	N		N	N	W	
253	40	F	N	Y	Y	N	N	N		N	N	W	
254	18	M	Y	N	N	Y	N	N		N	N	W	
255	50	F	N	Y	Y	Y	N	N		N	N	W	
256	44	M	Y	Y	N	N	N	Y		N	Y	W	
257	56	F	N	N	N	N	N	N		N	N	W	
258	42	M	Y	Y	Y	Y	N	N		N	N	W	
259	38	F	N	Y	N	Y	N	N		N	Y	W	
260	46	M	Y	Y	Y	N	N	N		N	N	W	
261	50	M	Y	Y	N	N	N	Y		N	Y	W	
262	42	F	Y	Y	N	Y	N	N		N	N	W	
263	22	M	N	Y	Y	N	N	N		N	N	W	
264	30	M	Y	Y	N	Y	N	N		N	N	W	

Sl No	Age	Sex	EBF 6M	SES 4 and 5	IMMUNIZATN	BCRP	SEPSIS	MALNUTRN	VENTILN	PICU 7 D	HOSPITL 7D	DIAGNOSIS	OUTCOME
265	35	M	N	Y	Y	Y	N	N		N	N	W	
266	40	F	Y	N	Y	N	N	N		N	N	W	
267	56	M	Y	Y	N	Y	N	Y		N	N	W	
268	46	M	Y	Y	Y	N	N	Y		N	Y	W	
269	52	F	Y	Y	N	Y	N	N		N	N	W	
270	54	M	N	Y	N	Y	N	N		N	N	W	
271	38	F	Y	Y	Y	N	N	N		N	N	W	
272	42	M	Y	N	N	N	N	N		N	N	W	
273	32	M	N	Y	N	Y	N	Y		N	Y	W	
274	46	F	Y	Y	N	N	N	N		N	N	W	
275	50	M	N	Y	Y	Y	N	N		N	N	W	
276	56	F	Y	Y	N	N	N	Y		N	N	W	
277	40	F	N	Y	Y	N	N	N		N	N	W	
278	42	M	Y	Y	Y	N	N	N		N	N	W	
279	38	F	Y	N	Y	Y	N	N		N	N	W	
280	30	M	Y	Y	N	Y	N	N		N	N	W	
281	36	F	N	N	Y	Y	N	N		N	N	W	
282	38	M	Y	N	Y	Y	N	Y		N	N	W	
283	26	F	Y	Y	Y	N	N	N		N	N	W	
284	38	M	N	Y	N	Y	N	N		N	Y	W	
285	44	F	Y	N	N	N	N	N		N	N	W	
286	36	M	Y	Y	N	Y	N	N		N	N	W	

Sl No	Age	Sex	EBF 6M	SES 4 and 5	IMMUNIZATN	BCRP	SEPSIS	MALNUTRN	VENTILN	PICU 7 D	HOSPITL 7D	DIAGNOSIS	OUTCOME
287	44	F	Y	N	Y	N	N	N		N	N	W	
288	36	M	Y	Y	N	N	N	N		N	N	W	
289	42	M	Y	N	N	N	N	N		N	Y	W	
290	30	F	Y	Y	N	Y	N	Y		N	Y	W	
291	28	M	N	Y	Y	N	N	N		N	N	W	
292	14	F	N	Y	N	Y	N	N		N	N	C	
293	23	F	N	Y	N	Y	N	Y		N	N	C	
294	18	M	Y	Y	N	Y	N	Y		N	N	C	
295	10	F	N	N	N	Y	N	N		N	N	C	
296	28	M	Y	Y	Y	Y	N	N		N	N	C	
297	30	M	Y	Y	N	N	N	N		N	N	C	
298	32	M	N	N	N	Y	N	Y		N	N	C	
299	26	F	Y	N	Y	N	N	N		N	N	C	
300	24	M	Y	Y	Y	N	N	N		N	N	C	
301	36	F	Y	Y	N	Y	N	N		N	N	C	
302	33	F	N	Y	Y	Y	N	N		N	N	C	
303	40	M	N	Y	Y	N	N	N		N	N	C	
304	38	M	N	Y	Y	Y	N	Y		N	N	C	
305	28	F	Y	Y	Y	Y	N	N		N	N	C	
306	30	M	N	N	Y	Y	N	N		N	N	C	

C. ABBREVIATIONS

1. KEY TO MASTER CHART

1. Sl. No. - Serial number
2. EBF - Exclusive Breast Feeding
3. SES - Socio-economic Status
4. BCRP - Bad Child Rearing Practice
5. MALNUTRN - Malnutrition
6. VENTILN - Mechanical Ventilation
7. PICU - Pediatric Intensive Care Unit
8. HOSPITL - Duration of Hospital Stay
9. P - Pneumonia
10. SP - Severe Pneumonia
11. VSP - Very Severe Pneumonia
12. Y - Yes
13. N - NO
14. RESP INF - Respiratory Infection

2. OTHER ABBREVIATIONS

1. WHO – World Health Organization.
2. ARI - Acute Respiratory Tract Infection
3. Hib - Haemophilus Influenzae type B
4. PCV - Pneumococcal Conjugate Vaccine
5. GAPPD - Global Action Plan for Pneumonia and Diarrhoea
6. UNICEF- United Nations Children's Fund
7. Z score - Standard Deviation For Weight for Age in WHO Percentile Charts
8. CHD - Congenital Heart Disease
9. OR - Odds Ratio
10. RR - Respiratory Rate
11. CRP - C-Reactive Protein
12. CXR - Chest X-Ray
13. RSV - Respiratory Syncytial Virus
14. URI - Upper Respiratory Tract Infection
15. LRI - Lower Respiratory tract Infection
16. DTP - Diphtheria Tetanus pertussis Vaccine
17. HIV - Human Immunodeficiency Virus
18. WBC - White Blood Cells
19. WALRI - Wheeze Assosiated Lower Respiratory Tract Infection

ஒப்புதல் படிவம்

திருநெல்வேலி மருத்துவக் கல்லூரி மருத்துவமனையில் இரண்டு மாதத்திலிருந்து ஐந்து வயது வரை உள்ள குழந்தைகளுக்கு ஏற்படும் நிமோனியா, சளி பற்றிய ஆராய்ச்சி நடைபெற்று வருகிறது.

குழந்தைகளுக்கு நிமோனியா, சளி மற்றும் காய்ச்சலால் எற்படும் பாதிப்புகள், காரணங்கள் சிகிச்சைமுறையின் விளைவுகள் முதலியவற்றை பற்றி கண்டறிவதே இந்த ஆராய்ச்சியின் நோக்கமாகும்.

இந்த ஆய்வில் பங்கேற்க நாங்கள் விரும்புகிறோம். இந்த ஆய்வினால் எங்கள் குழந்தையின் சிகிச்சைக்கு எவ்வித பாதிப்பும் ஏற்படாது என்பதை தெரிவித்துக்கொள்கிறோம்.

இந்த ஆய்வில் பங்கேற்பது என்னுடைய விருப்பத்தின் பேரில்தான் இருக்கிறது. மேலும் நாங்கள் எந்நேரமும் இந்த ஆய்வில் நினைத்தால் பின் வாங்க வாய்ப்பு உள்ளது என்பதை அறிவோம்.

இரத்த பரிசோதனை முடிவுகளை ஆய்வின் பொழுது அல்லது ஆய்வின் முடிவின்பொழுது எங்களுக்கு தெரிவிக்கப்படும் என்பதையும் அறிவோம்.

எங்களது குழந்தைகளை பரிசோதனைக்கு உட்படுத்துகிறோம். எனவே முழுமனதுடன் சம்மதிக்கிறோம்.

கையொப்பம்